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*Vocabulary Development
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ABSTRACT

This module provides information on development and use of a Material Safety Data Sheet (MSDS) software program that seeks to link literacy skills education, safety training, and human-centered design. Section 1 discusses the development of the software program that helps workers understand the MSDSs that accompany the chemicals with which they work, thereby enabling them to work more safely. It describes the iterative design approach and provides the following: consent statement for participation in the experiment, pretest/posttest with accompanying MSDS packet, evaluation sheet for users of the MSDS software, and user survey. Section 2 provides information on two software programs: (1) STUBBY, a program that creates four levels of exercises for employees to learn about their pay stub while improving their basic skills, and (2) Workplace Vocabulary Builder, a program that helps employees learn workplace specific vocabulary. A STUBBY pretest/posttest is included. Section 3 on interactive knowledge provides information on TEXTdisc, a CD-ROM disc containing multimedia workplace literacy courseware that is designed to help textile employees improve their reading and math skills, and companion videotape that provides an introduction to TEXTdisc and is designed to motivate employees to complete the program. This section contains an instructional outline of the video introduction and reading and math components and sample TEXTdisc crossword puzzles. (YLB)

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COMPUTER PROGRAMS

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COMPUTER PROGRAMS



Section 1: MSDS

Tiffoni Anderson is a Master's student in Industrial Engineering at Clemson University. Her major area of interest is Human Factors Engineering. She is employed as a research assistant on the Literacy grant, developing a Material Safety Data Sheet (MSDS) software program which seeks to link literacy skills education, safety training, and human-centered design. The focus of the software program is to enable workers to better understand the MSDSs that accompany the chemicals they work with, thereby enabling them to work more safely.

Section 2:

TobyCat Productions Announces:

*STUBBY

*WORKPLACE VOCABULARY BUILDER

Section 3:

Interactive Knowledge Presents:

*Text Disc

SECTION 1

MSDS

MATERIAL SAFETY DATA SHEETS (MSDS)

INTRODUCTION

The focus of this work is to use an iterative design approach to develop educational software on material safety data sheets. The work is being funded through the National Workplace Literacy Grant at J.P. Stevens' Clemson, S.C. plant. Presently, supervisors at the plant read the material safety data sheets to their workers. The high vocabulary level of the sheets and the general low literacy level of the workers suggest that simply reading the MSDSs to the workers is not beneficial in terms of increasing the workers' understanding of the chemicals they use. Creating and using educational software to bridge the gap between the reading level of the workers and of the MSDSs might fill this need as mandated by OSHA's Chemical Right to Know law.

The software is presented in two parts; two separate modules address the following areas (one area per module):

1. Technical Vocabulary
2. Material Safety Data Sheet Format

The first module defines the highly technical and legal vocabulary found on MSDSs at a more reasonable reading level for the workers. This module establishes a link between classroom literacy skills and job-oriented training. The second module presents information about the format of the MSDSs so that workers can gain understanding of where to find needed information on a material safety data sheet.

A third module is to be included in the software package at a later date. This module will depict scenarios of chemical accidents. The user will be required to synthesize what they have learned in the first two modules to come up with an appropriate course of action.

METHOD

The methodology followed is based on Rouse's Human-Centered Design and Gould's iterative design approaches. Data is collected on the intended user groups. Behavioral goals are set to ensure that the software meets the needs previously identified. These behavioral goals include standards for the users' performance on particular tasks, as well as their subjective opinions of the software package. The software is developed using Macintosh and the interface development software, HyperCard. Design of the software is an iterative process where users' subjective and objective responses are used to improve the design of the software. During user testing, all mouse events are recorded, thereby collecting quantitative data on each user's performance. After presenting the software to users,

subjective responses are collected with questionnaires and interviews. This objective and subjective data are then used to revise the software. After revision, the software is presented to the users again. More data is collected. This process continues until the behavioral goals have been met and no more suggestions or changes can be discerned.

To determine the effectiveness of the software (how much users learn from completing the package and if this knowledge is retained for a specified length of time), pretests and post-tests are administered to participants. Before having any contact with the software, participants are given a pretest to determine their current level of knowledge. The participants then work through the software at their own pace during class time. After completing the software, the participants fill out a questionnaire to gauge their opinion of the software. These workers then take a post-test to determine their new level of knowledge. Sometime after the completion of the MSDS software in the classroom, the participants will be asked to take another post-test. The sample of workers used in the pre and post-test analysis are not exposed to the iterative testing proves so that bias will not be introduced into the study.

EVALUATION

Statistical evaluation of test data will occur after all participants from the finishing class have completed the work in the classroom on the MSDS software. An ANOVA will be used to determine if there is any statistical difference between the participants' performances on the pre- and post-tests. The latter post-test is given so that a statistical test determining longer-term retention can be performed.

Subjective evaluation of the software by users is also very important. Higher subjective ratings by users, generally point to more acceptable and more effective designs. Data gathered from the surveys given at the end of the class will be used to further enhance the design of the software.

**IRB INFORMED CONSENT STATEMENT FOR
THE APPLICATION OF THE HUMAN-CENTERED DESIGN APPROACH TO
THE DESIGN OF EDUCATIONAL SOFTWARE**

INFORMATION

You have been invited to participate in a research study, entitled The Application of the Human-Centered Design Approach to the Design of Educational Software. If you agree to participate, you will be one of approximately 30 subjects who will be participating in the study.

You will be asked to work through a software package on Material Safety Data Sheets and give your comments on how it could be improved. Material Safety Data Sheets are papers with facts about chemicals on them. These sheets tell you how to work safely with the chemicals you use on your job. The sheets also tell you about health risks you face when working with the chemicals. Before working with the software, you will be asked to take a short test on Material Safety Data Sheets. As you are working through the software package, the computer will record the actions you take on the computer. After you have finished, you will be asked to take another test on Material Safety Data Sheets. You will also be asked to fill out a survey giving your opinion of the software. The scores of your tests and your opinions will not be revealed to anyone other than yourself and the investigators conducting this study. Each person will be assigned a code, so that test scores and opinions cannot be traced to a particular participant. These tests you take have nothing to do with job evaluations; they are simply to help find weaknesses in the software.

It is possible that you may feel frustrated with the software at times. It will be extremely helpful if you tell us about these times so that we may correct any mistakes we have made. Please remember that any frustration you feel is because of difficulties in the software, not because you have done anything wrong. We regret any stress or frustration you may feel, but your participation will help us create software that is easier for everyone in the plant to use.

PLEASE REMEMBER

1. You have the right to stop participating in the experiment at any time.
2. You have the right to see your data and withdraw them from the study. If you decide to withdraw your data, please notify the investigator immediately. Identification of your data will only be possible by asking the investigators; no one else will have access to the codes which identify which data belong to a particular person.
3. If you have any questions about the study, please ask them. We will answer your questions as much as possible without biasing the study's results. Should you have any additional questions or problems, contact Dr. Joel S. Greenstein, at 656-5649.

Subject's Initials _____

CONSENT

I have been given an opportunity to ask questions about this study; answers to such questions (if any) have been satisfactory.

The information in the study records will be kept confidential and will be made available only to persons conducting the study unless I specifically give my permission in writing to do otherwise. In any results of this study that are published, I will not be identified.

In consideration of all of the above, I give my consent to participate in this research study. I understand that I may drop out of this study at any point if I so choose.

I acknowledge receipt of a copy of this informed consent statement.

SIGNATURE OF SUBJECT _____

DATE: _____

SIGNATURE OF WITNESS _____

SIGNATURE OF INVESTIGATOR _____

After each sentence, there is a list of words or numbers.
Circle the words or numbers that best complete the sentence.

1. The main routes of entry of chemicals into the body are
_____, _____, and _____.
eyes ears nose skin mouth
2. Government regulations require that every material safety data
sheet has at least _____ sections.
4 8 12 16
3. The federal government agency that controls the way companies
handle material safety data sheets with their associates is the
_____.
EPA FBI OSHA ANSI

Circle T if you think the sentence is true or F if you think the sen-
tence is false.

4. T / F A material safety data sheet must always give the name and
address of the manufacturer.
5. T / F A material safety data sheet must list the exact names of
all of the components of the chemical.
6. T / F Material safety data sheets must have a section which tells
you specifically how to throw away a chemical.
7. T / F All material safety data sheets are required by Federal law
to contain exactly the same information and in the same
order .

Match the word and its definition. Write the letter of the best choice in the blank beside the word.

- | | |
|------------------------|---|
| 8. _____ Reactivity | A. Substance which causes cancer |
| _____ Carcinogen | B. The ability of a substance to dissolve in water |
| _____ Toxic | C. The tendency of a substance to undergo a chemical reaction |
| _____ Water solubility | D. Substance which will make people and animals sick |

The answers to the next two questions can be found in the MSDS packet supplied with the test. Look through the sheets to find the best answer to each question. Mark the space beside the answer you think is the best choice.

9. Your friend Joe has just splashed caustic soda solution in his eye. What is the very first thing you should do to help?

- _____ Go call a doctor
- _____ Go get your supervisor
- _____ Take him immediately to the first aid station
- _____ Rinse his eye with lots of fresh water
- _____ Cover his eye with a patch and take him to the emergency room

10. Can you expect that Polybinder 359NR4 will stay in its original form after being stored for a long time?

- _____ YES
- _____ NO

WEST POINT PEPPERELL, INC.
CHEMICAL EVALUATION NOTICE

15-APR-92

OSHA RATING: HAZARDOUS

SDS for the following product has been evaluated by the
Research Center and the product is approved for use:

PRODUCT NAME: CHLORINE LIQUID GAS
MANUFACTURER: VAN WATERS & ROGERS, INC.
EVAL NO. AB-251-HC
IDENTITY: CFP-W02
TESTED BY: MARK MULLINS

CONTAINS A HAZARDOUS WASTE COMPONENT. CONTACT MATT BIRDSOING
AT THE RESEARCH CENTER, OR THE CORPORATE LAW DEPARTMENT
FOR SPILL RESPONSE OR DISPOSAL PROCEDURES.

CONTAINS AN EPA EXTREMELY HAZARDOUS SUBSTANCE (EHS). REPORTING
FOR TITLE III, SEC. 302, OR 311 AND 312 MAY BE REQUIRED.

CONTAINS AN EPA TOXIC SUBSTANCE (TXS). REPORTING FOR TITLE III
SEC. 313 MAY BE REQUIRED.

THIS CEN APPLIES ONLY TO THE MSDS DATED: 11/2/90 **

This CEN applies to the MSDS you sent to us, and should be
attached to the copy you kept.
Please check the date on your MSDS for this product and
eliminate any older versions.

BEST COPY AVAILABLE

CHLORINE LIQUIFIED GAS

EFFECTIVE DATE: 11-02-90

MAIL TO:

89146791
JP STEVENS & CO INC
ATTN: PLANT CHEMIST

ORDER NO: 892508999
PROD NO: 04094414

CLEMSON FILTER PLANT
CLEMSON SC 29631

VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
1600 NORTON BLDG. SEATTLE, WA 98104-1564 (408) 435-8700

-----EMERGENCY ASSISTANCE-----

EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800) 424-9300

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: CHLORINE

CAS NO.: 7782-50-5

COMMON NAMES/SYNONYMS: CHLORINE
REG. NO. 550-177

MSDS #: P1011

FORMULA: CL₂

DATE ISSUED: 10/90

MOLECULAR WEIGHT: 70.90

SUPERCEDES: 08/89

HAZARD RATING (NFPA 49)

HMIS RATING

HEALTH: 3

HAZARD RATING SCALE:

HEALTH: 3

FIRE: 0

0=MINIMAL 3=SERIOUS

FIRE: 0

REACTIVITY: 0

1=SLIGHT 4=SEVERE

REACTIVITY: 0

SPECIAL: OXY

2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	%	EXPOSURE LIMITS, PPM			HAZARD
		OSHA PEL	ACGIH TLV	OTHER LIMIT	
CHLORINE	99.5	0.5	1	1.0 CEILING	TOXIC; CORROSIVE; COMPRESSED GAS

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: -29

VAPOR PRESSURE, MM HG/20 DEG C: 4800

pH: ACIDIC

FREEZING POINT, DEG F: -150

VAPOR DENSITY (AIR=1): 2.5

SPECIFIC GRAVITY (WATER=1): 1.41 (LIQUID)

WATER SOLUBILITY, %: 0.7

APPEARANCE AND ODOR:

EVAPORATION RATE (BUTYL ACETATE=1): N/A

PALLID-YELLOW GAS OR LIQUID,

PUNGENT, PUNGENT ODOR

VOLATILE (BY VOLUME): 100

-----FIRST AID MEASURES-----

PROD NO: 04094414 04:28:09 14 AUG 1991 CUST: 89146791 INVOICE: 892508999

CHLORINE LIQUIFIED GAS

EFFECTIVE DATE 11-02-90

INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

CASE OF SKIN CONTACT: TREAT FOR INHALATION EXPOSURE FIRST. IMMEDIATELY FLUSH SKIN WITH LOTS OF RUNNING WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET IMMEDIATE MEDICAL ATTENTION.

SWALLOWED: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

3 TO PHYSICIAN: TREATMENT FOR INHALATION IS SYMPTOMATIC AND SUPPORTIVE. PATIENT AT REST UNTIL RESPIRATORY SYMPTOMS SUBSIDE. SEDATION FOR ANXIETY OR RESTLESSNESS MAY BE CONSIDERED TO PREVENT PULMONARY EDEMA, AS WELL AS DIURETICS AND ANTIBIOTICS TO ALLEVIATE EDEMA AND PROTECT AGAINST SECONDARY INFECTION. ADMINISTER OXYGEN UNDER EXHALATION PRESSURE NOT EXCEEDING 4 CM WATER FOR 15 MINUTES EACH HOUR UNTIL SYMPTOMS SUBSIDE. CAUTION IN PRESENCE OF IMPENDING OR EXISTING CARDIOVASCULAR FAILURE).

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: INHALATION

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: VAPORS AND MISTS ARE EXTREMELY CORROSIVE TO THE NOSE, THROAT, AND MUCCOUS MEMBRANES. BRONCHITIS, PULMONARY EDEMA, AND CHEMICAL PNEUMONITIS MAY OCCUR. IRRITATION, COUGHING, CHEST PAIN, AND DIFFICULTY IN BREATHING MAY OCCUR WITH BRIEF EXPOSURE WHILE PROLONGED EXPOSURE MAY RESULT IN MORE SEVERE IRRITATION AND TISSUE DAMAGE. BREATHING HIGH CONCENTRATIONS MAY RESULT IN DEATH.

EYE CONTACT: VAPORS, LIQUID, AND MISTS ARE EXTREMELY CORROSIVE TO EYES. BRIEF CONTACT OF THE VAPORS WILL BE SEVERELY IRRITATING. PROLONGED CONTACT OF THE LIQUID OR MISTS WILL SEVERELY DAMAGE THE EYES AND PROLONGED CONTACT MAY CAUSE PERMANENT EYE INJURY WHICH MAY BE FOLLOWED BY BLINDNESS.

SKIN CONTACT: LIQUID CHLORINE WILL BURN THE SKIN. HIGH CONCENTRATIONS OF GAS WILL IRRITATE THE SKIN AND MAY FORM BLISTERS.

SWALLOWED: SWALLOWING IS UNLIKELY BECAUSE CHLORINE IS A GAS AT ROOM TEMPERATURE AND PRESSURE. INGESTION OF LIQUID WOULD CAUSE SEVERE INTERNAL INJURIES.

CHRONIC EFFECTS OF EXPOSURE: MAY CAUSE CORROSION OF THE TEETH, SKIN IRRITATION, AND REDUCED RESPIRATORY CAPACITY.

CHRONIC CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: ASTHMA, BRONCHITIS, EMBELEM AND OTHER LUNG DISEASES AND CHRONIC NOSE, SINUS OR THROAT CONDITIONS.

-----TOXICITY DATA-----

ACUTE: NO DATA FOUND BECAUSE CHLORINE IS A GAS AT ROOM TEMPERATURE.

CHRONIC: NO DATA FOUND BECAUSE CHLORINE IS A GAS AT ROOM TEMPERATURE.

INHALATION: HUMAN LC50 = 873 PPM/30 MIN; RAT LC50 = 293 PPM/1 HR; ORAL LC50 = 127 PPM/1 HR

MUTAGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

SD: 04094414 04:28:09 14 AUG 1991 CUST: 69146791 INVOICE: 692506999

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CHLORINE LIQUIFIED GAS

EFFECTIVE DATE: 11-02-90

PHYSICAL DATA: THE ODOR THRESHOLD FOR CHLORINE GAS IS 0.02-0.2 PPM. HIGH OLFACTORY FATIGUE MAY DEVELOP AFTER CHRONIC LOW LEVEL EXPOSURES. AT 0.2-0.5 PPM IN AIR THERE ARE NO REPORTED LONG-TERM EFFECTS; 1-3 PPM IRRITATE THE NOSE AND EYES; 5 PPM IRRITATES THE THROAT; 10 PPM CAUSES INTENSE COUGHING; 40-60 PPM MAY CAUSE SERIOUS DAMAGE; 100 PPM MAY CAUSE LETHAL DAMAGE; 1000 PPM MAY BE FATAL WITH A FEW DEEP BREATHS.

-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAIN- TAINING EMISSIONS AT THE POINT OF USE BELOW THE PEL. PROVIDE SUITABLE VENTILATION FOR LOW LYING AREAS.

RESPIRATORY PROTECTION: WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE TO THE VAPOR OR MIST CONCENTRATION AT THE POINT OF USE. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ACID GASES/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

PROTECTION: CHEMICAL GOGGLES AND FULL FACESHIELD UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, IMPERVIOUS GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE AVAILABLE AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: NONE
TEST METHOD USED: N/A

FLAMMABLE LIMITS IN AIR, %
LOWER: N/A UPPER: N/A

IGNITION TEMPERATURE, DEG F: NOT APPLICABLE

EXTINGUISHING MEDIA: THIS MATERIAL IS NOT COMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE. CHLORINE WILL SUPPORT COMBUSTION.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE. TANKS OR CYLINDERS WILL RELEASE CHLORINE WHEN FUSIBLE METAL SAFETY PLUGS MELT 158-165 DEG F.

USUAL FIRE AND EXPLOSION HAZARDS: CHLORINE WILL SUPPORT THE BURNING OF COMBUSTIBLE MATERIALS JUST AS OXYGEN DOES. FLAMMABLE GASES AND LIQUIDS CAN FORM EXPLOSIVE MIXTURES WITH CHLORINE. LIQUID CHLORINE CAN REACT WITH WHITE SOLID METALS SUCH AS ALUMINUM, CARBON STEEL, AND FINELY DIVIDED IRON.

-----HAZARDOUS REACTIVITY-----

STABILITY: STABLE
CONDITIONS TO AVOID: INTENSE LOCAL HEAT
POLYMERIZATION: WILL NOT OCCUR

MATERIALS TO AVOID: REDUCING AGENTS, COMBUSTIBLE MATERIALS, ORGANIC CHEMICALS, FINELY DIVIDED METALS AND WATER.

HAZARDOUS DECOMPOSITION PRODUCTS: CHLORINE DOES NOT DECOMPOSE BUT REACTS WITH WATER TO FORM HYDROCHLORIC ACID AND WITH CARBON MONOXIDE TO FORM PHOSGENE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: ONLY SPECIALLY TRAINED PERSONNEL

DD: 04094414 04:28:09 14 AUG 1991 CUST: 69146791 INVOICE: 892508799

CHLORINE LIQUIFIED GAS

EFFECTIVE DATE: 11-02-90

DO NOT ATTEMPT REPAIRS. WEAR ACID-RESISTANT SLICKER SUIT AND COMPLETE PROTECTIVE EQUIPMENT INCLUDING RUBBER GLOVES, RUBBER BOOTS, AND CHEMICAL GASSES AND FACESHIELD. WEAR SELF-CONTAINED BREATHING APPARATUS. STOP FLOW OF GAS. IF THE LEAK CANNOT BE STOPPED IN PLACE AND IS IN AN UNDESIRABLE PLACE, MOVE THE CONTAINER TO THE OPEN AIR IF IT IS SAFE TO DO SO. SHIFT THE CONTAINER SO GAS, RATHER THAN LIQUID, LEAKS. REPAIR THE LEAK OR ALLOW THE CYLINDER TO EMPTY THROUGH A REDUCING AGENT, SUCH AS SULFUR DIOXIDE BISULFIDE AND SODIUM BICARBONATE. NEVER APPLY WATER TO A CHLORINE

DISPOSAL METHODS: BUBBLE THROUGH A LARGE VOLUME OF 15% SODIUM HYDROXIDE SOLUTION OR OTHER ALKALI, OR DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS

CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO OBTAIN PROPER DISPOSAL PROCEDURES.

EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

HANDLING AND STORAGE PRECAUTIONS: STORE IN A COOL, DRY AREA OUT OF DIRECT SUNLIGHT AND PROTECTED FROM MOISTURE. STORE AWAY FROM OTHER COMPRESSED GASES, INCOMPATIBLE MATERIALS, AND COMBUSTIBLE MATERIALS. USE AN APPROVED CHLORINE WRENCH ONLY.

USE AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL NEAR THIS CONTAINER.

OTHER PRECAUTIONS: DO NOT ATTEMPT TO HANDLE, STORE, OR USE CHLORINE WITHOUT A COMPLETE REVIEW BY ALL PERSONNEL OF THE CHLORINE INSTITUTE'S CHLORINE MANUAL. ALSO, ATTENDANCE AT A VAN WATERS & ROGERS, INC. SEMINAR ON CHLORINE HANDLING IS SUGGESTED.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL CONTAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND TREAT ALL EMPTY CONTAINERS AS IF THEY WERE FULL.

-----ECOLOGICAL INFORMATION SECTION-----

DATA FOUND

-----OTHER REGULATORY INFORMATION-----

SECTION 313: THIS PRODUCT IS A TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

SECTION 65: NONE

SECTION 313 & PROP. 65: SEE ABOVE

SECTION 313 (WITH CHEMICALS LISTED): SEE ABOVE

SECTION 65 (WITH CHEMICALS LISTED): NONE

MASSACHUSETTS: UNDER THE MASSACHUSETTS RIGHT-TO-KNOW LAW, HAZARDOUS SUBSTANCES AND EXTRAORDINARILY HAZARDOUS SUBSTANCES COMPONENTS PRESENT IN THIS PRODUCT WHICH REQUIRE REPORTING ARE:

EXTRAORDINARILY HAZARDOUS SUBSTANCES
CHEMICAL(S)

CAS NO.

CONCENTRATION (>0.0001%)

CHLORINE

7782-50-5

99.5

PENNSYLVANIA: UNDER THE PENNSYLVANIA RIGHT-TO-KNOW LAW, HAZARDOUS SUBSTANCES AND SPECIAL HAZARDOUS SUBSTANCES COMPONENTS PRESENT IN THIS PRODUCT WHICH REQUIRE REPORTING ARE:

04094414 04:28:09 14 AUG 1991 CUST: 89146791 INVOICE: 892508999

ORINE LIQUIFIED GAS

EFFECTIVE DATE: 11-02-90

HAZARDOUS SUBSTANCES
IDENTIFICATION(S)

CAS NO.

CONCENTRATION (>1%)

ORINE

7782-50-5

99.5

CALIFORNIA SCAGMD: NONE

A: THE INGREDIENTS OF THIS PRODUCT ARE ON THE TSCA INVENTORY.

OTHER REGULATORY INFORMATION

DO NOT DETACH THIS SECTION FROM THE MSDS AND BE SURE TO
INCLUDE THIS SECTION WHEN COPYING THE MSDS.

REVISION

89: REVISED PEL

90: CHANGED HEADING AND CONTACT INFORMATION.

90: ADDED: MOLECULAR WEIGHT, HMIS RATING, NOTES TO PHYSICIAN, PH, %
VOLATILE, OTHER REGULATORY INFORMATION 2, 3, 4, 5, 7, 8, 9, 10, AUTOIGNITION,
LOGICAL INFORMATION, DISPOSAL METHODS

91: ADDED: MEDICAL CONDITIONS, SPILL, PROTECTIVE CLOTHING

FOR ADDITIONAL INFORMATION

CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408) 435-6700

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THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS
SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF
INjury, ILLNESS, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICA-
TION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS
INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT
RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER
PROCESS.

**** END OF MSDS ****

ID: 04094414 04:28:09 14 AUG 1991 CUST: 89146791 INVOICE: 892508999

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WEST POINT PEPPERELL, INC.
CHEMICAL EVALUATION NOTICE

24-MAR-92

OSHA RATING: HAZARDOUS

The MSDS for the following product has been evaluated by the Research Center and the product is approved for use:

CHEMICAL NAME: ACETIC ACID 20-80%; ACETIC ANHYDRIDE BLEND 20-80%
VENDOR: HOECHST CELANESE CORPORATION
APPROVAL NO. AD-205-HC
FACILITY: CFP-D14-B04
REQUESTED BY: MARK MULLINS

* CONTAINS A HAZARDOUS WASTE COMPONENT. CONTACT MATT BIRDSONG
AT THE RESEARCH CENTER, OR THE CORPORATE LAW DEPARTMENT
FOR SPILL RESPONSE OR DISPOSAL PROCEDURES.

** THIS CEN APPLIES ONLY TO THE MSDS DATED: FEBRUARY 16, 1990 **

1. This CEN applies to the MSDS you sent to us, and should be attached to the copy you kept.
2. Please check the date on your MSDS for this product and eliminate any older versions.

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Chemical Group
Hoechst Celanese Corporation
P.O. Box 569320 / Dallas, Texas 75356-9320
Information phone: 214 689 4000
* Emergency phone: 800 424 9300 (CHEMTREC)

20-80% ACETIC ACID/ 20-80% ACETIC ANHYDRIDE, BLEND

Issued February 16, 1990

46

Identification

Product name: 20-80% Acetic acid/
20-80% acetic anhydride, blend

Chemical name: Acetic anhydride/
acetic acid solution

Department of Transportation information

Shipping name: Corrosive Liquid, NOS
(Acetic Acid, Acetic Anhydride)

Hazard classification: Corrosive Material

United Nations number: UN1760

Emergency Response Guide no.: 60

* Reportable Quantity: 5000 lb/2270 kg

Physical data

(All values are approximate.)

Boiling point (760 mm Hg): 126°C (259°F)

Freezing point: -15°C (5°F)

Specific gravity (H₂O = 1 @ 20/20°C): 1.06

Vapor pressure (20°C): 8 mm Hg

Vapor density (Air = 1 @ 20°C): 2.5

Solubility in water (% by WT @ 20°C):
Complete

Percent volatiles by volume: 100

Appearance and odor: Clear, colorless,
mobile liquid with strong, vinegar-like,
acid odor.

Fire and explosion hazard data

(All values are approximate.)

Flammable limits in air, % by volume

Upper: 16.6

Lower: 2.7

Flash point (test method):

Tag closed cup (ASTM D56): 117°F (47°C)

Extinguishing media:

Use CO₂ or dry chemical for small fires,
alcohol-type aqueous film-forming foam
or water spray for large fires.

Special fire-fighting procedures:

* If potential for exposure to vapors
or products of combustion exists,
wear complete personal protective
equipment and respirator approved
by both NIOSH and MSHA:

Self-contained breathing apparatus
with full facepiece operated in pressure
demand or other positive pressure
mode.

Component information (See Glossary at end of MSDS for definitions.)

Component, wt. % (CAS number)	Exposure levels			Subject to SARA §313 reporting?
	OSHA PEL	ACGIH TLV® TWA	IDH H	
* Acetic acid, 20-80% (64-19-7)	10 ppm, TWA	10 ppm, TWA; 15 ppm, STEL(1)	1000 ppm	No
* Acetic anhydride, 20-80% (108-24-7)	5 ppm, ceiling (15)	5 ppm, ceiling (15)	1000 ppm	No

(1) All components listed as required by federal, California, New Jersey and Pennsylvania regulations.

(2) Hoechst Celanese has adopted the ACGIH TLV.

Supplied-air respirator with full
facepiece and operated in pressure-
demand or other positive pressure
mode in combination with an auxiliary
self-contained breathing apparatus
operated in pressure-demand or other
positive pressure mode.

Water spray can be used to reduce
intensity of flames and to dilute spills to
nonflammable mixture. Use water spray
to cool fire-exposed structures and
vessels.

Unusual fire and explosion hazards:
During fire-fighting operations, avoid
directing water into vessels containing
anhydrides. Acetic anhydride reacts
vigorously with water, releasing heat.

Special hazard designations

	HMS	NFPA	Key
Health:	3	3	0 - Minimal
Flammability:	2	2	1 - Slight
Reactivity:	1	1	2 - Moderate
Personal protective equipment:	G	—	3 - Serious
			4 - Severe

SARA §311 hazard categories

Acute health:	Yes
Chronic health:	Yes
Fire:	Yes
Sudden release of pressure:	No
Reactive:	Yes

Reactivity data

Stability:
Stable

Hazardous polymerization:
Will not occur.

Conditions to avoid:
Flame.

Materials to avoid:

Water; alkalis such as caustic soda
(sodium hydroxide) and soda ash
(sodium carbonate); glycols; amines;
oxidizing agents such as hydrogen
peroxide, nitric acid, perchloric acid
or chromium trioxide; boric acid.

Hazardous combustion or
decomposition products:
Carbon monoxide.

Health data

Effects of exposure/toxicity data

Acute

Ingestion (swallowing): Causes severe
irritation of and damage to mouth,
throat and stomach. Slightly toxic to
animals (oral LD₅₀, rats: acetic acid -
3.3 g/kg; acetic anhydride - 1.8 g/kg).
Inhalation (breathing): Causes severe
irritation of nasal passages, throat
and lungs. Can cause pulmonary
edema (accumulation of fluid in the
lungs); signs and symptoms can be
delayed for several hours. Acetic
acid - practically non-toxic to
animals (inhalation LCLo, rats, 4 hrs:
16,000 ppm). Acetic anhydride -
slightly toxic to animals (inhalation
LCLo, rats, 4 hrs: 1000 ppm).
Skin contact: Can cause chemical burn.
Effect of exposure can be delayed.
Sensitization (allergic reaction) can
occur. Acetic acid - moderately toxic
to animals by absorption (dermal LD₅₀,
rabbits: 1.1 g/kg). Acetic anhydride -
slightly toxic to animals by absorption
(dermal LD₅₀, rabbits: 4.0 g/kg).
Eye contact: Can cause chemical burn -
damage irreversible (loss of vision).
Vapors are severely irritating.

(continued)

* New or revised information; previous version dated March 20, 1989.

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Hoechst 

Latest Revision Date... 02/20/91
 Print Date..... 02/14/92

Tancobind 704

SECTION 1

PRODUCT IDENTIFICATION

PRODUCT NUMBER..... 704
 MANUFACTURER'S NAME.... EVOQUE-TANNER INDUSTRIES
 COMPANY ADDRESS..... P.O. BOX 1967 GREENVILLE, SC 29602
 COMPANY PHONE NUMBER... (803)-232-3893
 TRADE NAME..... Tancobind 704
 CHEMICAL FAMILY..... Melamine Resin
 SDS PREPARED BY.....
 APPROVED BY..... Ken Snyder

SECTION 2

HAZARDOUS INGREDIENTS / HAZARD DATA

MATERIAL	PERCENT	CAS NUMBER	TLV (TWA)	STEL	PEL	SARA 313
			DDM, mg/cu m	DDM, mg/cu m	DDM, mg/cu m	
Butyl Alcohol	5	71-36-3	50*	150*	N/A N/A	100 300 Yes
Butyl Benzyl Phthalate	2	85-68-7	N/A	N/A	N/A	Yes
*Ceiling						

SECTION 3

PHYSICAL DATA

BOILING/MELTING POINT @760 mm Hg... 212°F
 VAPOR PRESSURE mm Hg @20° C..... As water
 VAPOR DENSITY (Air = 1)..... N/A
 PERCENT VOLATILE BY WEIGHT (%)..... >60
 DENSITY (lbs/gal)..... 8.33 lbs/gal. @ 77°F
 SOLUBILITY IN WATER..... dispersible
 EVAPORATION RATE..... as water
 APPEARANCE AND ODOR..... Milky emulsion, butyl alcohol odor

SECTION 4

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT °F (Test Method)..... 103°F (Method: Closed Cup)
 EXTINGUISHING MEDIA..... Foam, dry chemical, carbon dioxide, water fog.
 SPECIAL FIRE FIGHTING PROCEDURES... Spray fire exposed drums to cool.
 UNUSUAL FIRE & EXPLOSION HAZARDS... None known.

SECTION 5

REACTIVITY DATA

PRODUCT STABILITY..... Stable
 Conditions to Avoid..... None known.
 CHEMICAL INCOMPATIBILITY..... Strong acids in concentrated form.
 HAZARDOUS DECOMPOSITION PRODUCTS... CO, carbon dioxide and unidentified nitrogen compounds.
 HAZARDOUS POLYMERIZATION..... Will not occur.

SECTION 6

HEALTH HAZARD DATA * EFFECTS OF OVEREXPOSURE

SKIN CONTACT..... May cause irritation.
 EYE CONTACT..... Will cause irritation or redness.
 INHALATION..... May cause irritation of nose and throat.
 INGESTION..... Harmful if swallowed. Can cause irritation of nose and throat.
 CHRONIC EFFECTS OF OVEREXPOSURE... None Known.

(Continued on next page.)

SECTION 7

EMERGENCY AND FIRST AID PROCEDURES

SKIN..... Wash thoroughly with soap and water. Remove contaminated clothing and launder before reuse.
EYES..... Flush with cold water for 15 minutes. Contact physician.
INGESTION.... Do not induce vomiting. Get medical help.
INHALATION... If affected remove to fresh air. If symptoms persist contact physician.

SECTION 8

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION... Approved NIOSH/OSHA respirator if workplace concentration exceeds stated limits.
VENTILATION..... Provide sufficient ventilation to maintain exposure below stated TLV's.
PROTECTIVE CLOTHING..... Rubber or plastic gloves recommended.
EYE PROTECTION..... Safety glasses as required by OSHA or local work rules.
OTHER PRECAUTIONS..... None known.

SECTION 9

SPILL AND DISPOSAL INFORMATION

SPILL OR LEAK PROCEDURES... Absorb liquid on inert material and place in appropriate container. Do not contaminate lakes, streams, sewers or natural water supplies.
WASTE DISPOSAL METHOD..... Disposal must be in accordance with Federal, State, and local regulations.

SECTION 10

OTHER REGULATORY INFORMATION

TSCA..... We certify that all components of this product are registered under the regulations of the Toxic Substances Control Act.
DOT REGULATED... Combustible

SECTION 11

SUPPLIER INFORMATION

Products formulated to have fire retardant properties are manufactured and controlled to internal material and composition specifications. Evode-fanner Industries, Inc. makes no warranty, expressed or implied, as to the suitability or flame retardancy of these products on specific customer applications.

Evode-fanner Industries, Inc. makes no warranty of merchantability nor express or implied, in the sale of its products, and buyer assumes all risks and liability for the result obtained by the use of products, whether used singly or in combination with other products. Our conditions of sale are printed on our sales invoices.

Precautions to be taken in handling and storage: Keep container sealed to avoid moisture loss. Store between 40°F and 95°F.

WEST POINT PEPPERELL, INC.
CHEMICAL EVALUATION NOTICE

23-APR-92

OSHA RATING: HAZARDOUS

The MSDS for the following product has been evaluated by the Research Center and the product is approved for use:

CHEMICAL NAME: TANCORIND 704NA
VENDOR: EVODE-TANNER IND
APPROVAL NO. AP-148-HC
FACILITY: CFP-F07
REQUESTED BY: MARK MULLINS

- * CONTAINS A HAZARDOUS WASTE COMPONENT. CONTACT MATT BIRDSONG AT THE RESEARCH CENTER, OR THE CORPORATE LAW DEPARTMENT FOR SPILL RESPONSE OR DISPOSAL PROCEDURES.
- * CONTAINS AN EPA TOXIC SUBSTANCE (TXS). REPORTING FOR TITLE III SEC. 313 MAY BE REQUIRED.

** THIS CEN APPLIES ONLY TO THE MSDS DATED: 06/20/91 **

1. This CEN applies to the MSDS you sent to us, and should be attached to the copy you kept.
2. Please check the date on your MSDS for this product and eliminate any older versions.

Latest Revision Date... 06/20/91
Print Date..... 02/14/92

Tancobind 704NA

SECTION 1

PRODUCT IDENTIFICATION

PRODUCT NUMBER..... 704NA
MANUFACTURER'S NAME.... EVODE-TANNER INDUSTRIES
COMPANY ADDRESS..... P.O. BOX 1967 GREENVILLE, SC 29602
COMPANY PHONE NUMBER... (803)-232-3893
TRADE NAME..... Tancobind 704NA
CHEMICAL FAMILY..... Melamine Resin
MSDS PREPARED BY..... Jack Moore
APPROVED BY..... Ken Snyder

SECTION 2

HAZARDOUS INGREDIENTS / HAZARD DATA

MATERIAL	PERCENT	CAS NUMBER	TLV (TWA)	STEL	PEL	SARA 313
			PPM, mg/cu ft	PPM, mg/cu ft	PPM, mg/cu ft	
Butyl Alcohol	5	71-36-3	50* 150*	N/A N/A	100 300	Yes
Butyl Benzyl Phthalate	2	85-68-7	N/A	N/A	N/A	Yes
*Ceiling						

SECTION 3

PHYSICAL DATA

BOILING/MELTING POINT @760 mm Hg... 212°F
VAPOR PRESSURE mm Hg @20° C..... As water
VAPOR DENSITY (Air = 1)..... N/A
PERCENT VOLATILE BY WEIGHT (t)..... >60
DENSITY (lbs/gal)..... 8.39 lbs/gal. @ 77°F
SOLUBILITY IN WATER..... dispersible
EVAPORATION RATE..... as water
APPEARANCE AND ODOR..... milky emulsion, butyl alcohol odor

SECTION 4

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT °F (Test Method)..... 108°F (Method: Closed Cup)
EXTINGUISHING MEDIA..... Foam, dry chemical, carbon dioxide, water fog.
SPECIAL FIRE FIGHTING PROCEDURES... Spray fire exposed drums to cool.
UNUSUAL FIRE & EXPLOSION HAZARDS... None known.

SECTION 5

REACTIVITY DATA

PRODUCT STABILITY..... Stable
Conditions to Avoid..... None known.
CHEMICAL INCOMPATIBILITY..... Strong acids in concentrated form.
HAZARDOUS DECOMPOSITION PRODUCTS... CO, carbon dioxide and unidentified nitrogen compounds.
HAZARDOUS POLYMERIZATION..... Will not occur.

SECTION 6

HEALTH HAZARD DATA * EFFECTS OF OVEREXPOSURE

SKIN CONTACT..... May cause irritation.
EYE CONTACT..... Will cause irritation or redness.
INHALATION..... May cause irritation of nose and throat.
INGESTION..... Harmful if swallowed. Can cause irritation of nose and throat.
CHRONIC EFFECTS OF OVEREXPOSURE... None Known.

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(Continued on next page.)

SECTION 7

EMERGENCY AND FIRST AID PROCEDURES

SKIN..... Wash thoroughly with soap and water. Remove contaminated clothing and launder before reuse.
EYES..... Flush with cold water for 15 minutes. Contact physician.
INGESTION.... Do not induce vomiting. Get medical help.
INHALATION... If affected remove to fresh air. If symptoms persist contact physician.

SECTION 8

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION... Approved NIOSH/OSHA respirator if workplace concentration exceeds stated limits.
VENTILATION..... Provide sufficient ventilation to maintain exposure below stated TLV's.
PROTECTIVE CLOTHING..... Rubber or plastic gloves recommended.
EYE PROTECTION..... Safety glasses as required by OSHA or local work rules.
OTHER PRECAUTIONS..... None known.

SECTION 9

SPILL AND DISPOSAL INFORMATION

SPILL OR LEAK PROCEDURES... Absorb liquid on inert material and place in appropriate container. Do not contaminate lakes, streams, sewers or natural water supplies.
WASTE DISPOSAL METHOD..... Disposal must be in accordance with Federal, State, and Local regulations.

SECTION 10

OTHER REGULATORY INFORMATION

TSCA..... We certify that all components of this product are registered under the regulations of the Toxic Substances Control Act.
DOT REGULATED... Combustible

SECTION 11

SUPPLIER INFORMATION

Products formulated to have fire retardant properties are manufactured and controlled to internal material and composition specifications. Evode-Tanner Industries, Inc. makes no warranty, expressed or implied, as to the suitability or flame retardancy of these products on specific customer applications.

Evode-Tanner Industries, Inc. makes no warranty of merchantability nor express or implied, in the sale of its products, and buyer assumes all risks and liability for the result obtained by the use of products, whether used singly or in combination with other products. Our conditions of sale are printed on our sales invoices.

Precautions to be taken in handling and storage: Keep container sealed to avoid moisture loss. Store between 40°F and 95°F.

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WEST POINT PEPPERELL, INC.
CHEMICAL EVALUATION NOTICE

31-MAR-92

OSHA RATING: HAZARDOUS

The MSDS for the following product has been evaluated by the Research Center and the product is approved for use:

CHEMICAL NAME: SODIUM HYDROXIDE 50%; CAUSTIC SODA SOLUTION 50%
VENDOR: DOW CHEMICAL U.S.A.
APPROVAL NO. AA-523-HC
FACILITY: CFP-B04-D14-P24
REQUESTED BY: MARK MULLINS

* CONTAINS A HAZARDOUS WASTE COMPONENT. CONTACT MATT BIRDSONG AT THE RESEARCH CENTER, OR THE CORPORATE LAW DEPARTMENT FOR SPILL RESPONSE OR DISPOSAL PROCEDURES.

** THIS CEN APPLIES ONLY TO THE MSDS DATED: 06/14/90 **

1. This CEN applies to the MSDS you sent to us, and should be attached to the copy you kept.
2. Please check the date on your MSDS for this product and eliminate any older versions.

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**Dow U.S.A.**The Dow Chemical Company
Midland, Michigan 48674**Material Safety Data Sheet**

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product code: 15216

Page: 1

Product Name: CAUSTIC SODA SOLUTION 50%

Effective Date: 06/14/90 Date Printed: 01/06/92

MSDS:000101

1. INGREDIENTS: (% w/w, unless otherwise noted)

Sodium hydroxide (NaOH)	CAS# 001310-73-2	48.5-50.5%
Sodium carbonate (Na ₂ CO ₃)	CAS# 000497-19-8	<0.2%
Sodium chloride (NaCl)	CAS# 007647-14-5	<1.0%
Water	CAS# 007732-18-5	BAL

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: Approximately 293F, 145C
FREEZING POINT: Approximately 58F, 14C
VAP. PRESS: 1.5 mmHg, 0.2 kPa @ 20C
VAP. DENSITY: Not applicable
SOL. IN WATER: Water solution
SP. GRAVITY: @ 20C (Dens.) 1.52 g/ml
APPEARANCE: Colorless to slightly colored liquid.
ODOR: No odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: None
METHOD USED: Not applicable

FLAMMABLE LIMITS
LFL: Not applic.
UFL: Not applic.

EXTINGUISHING MEDIA: Non-combustible.

FIRE & EXPLOSION HAZARDS: In water solution caustic can react with amphoteric metals (such as aluminum) generating hydrogen which is flammable and/or explosive if ignited.

FIRE-FIGHTING EQUIPMENT: Wear self-contained (positive-pressure if available) breathing apparatus and full protective clothing.

(Continued on page 2, over)

(R) Indicates a Trademark of The Dow Chemical Company

* An Operating Unit of The Dow Chemical Company



Product Name: CAUSTIC SODA SOLUTION 50%

Effective Date: 06/14/90 Date Printed: 01/06/92

MSDS:000101

7. FIRST AID:

EYES: WATER is the only accepted method of removal of caustic soda (lye) from the eyes or skin. You may have 10 seconds or less to avoid serious permanent injury. Therefore, IMMEDIATE first aid must be given after any injurious exposure. Moving the victim from water access for transport to medical aid should be done only on the advice of qualified medical personnel. While transporting victim to a medical facility, continue washing if possible.

In case of eye contact, wash eyes immediately and continuously for 30 minutes. Call for medical assistance immediately.

SKIN: Immediate continued and thorough washing in flowing water for 30 minutes is imperative while removing contaminated clothing. Prompt medical consultation is essential. Wash contaminated clothing before reuse. Destroy contaminated shoes.

INGESTION: Do not induce vomiting. Give large amounts of water or milk if available and transport to medical facility.

INHALATION: Remove to fresh air if effects occur. Consult medical:

NOTE TO PHYSICIAN: Corrosive. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagoscopy control. Material is strong alkali. If burn is present, treat as any thermal burn, after decontamination. For burns of skin only. Eye irrigation may be necessary for an extended period of time to remove as much caustic as possible. Duration of irrigation and treatment is at the discretion of medical personnel. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): Sodium hydroxide: OSHA PEL and ACGIH TLV are 2 mg/m³ Ceiling.

VENTILATION: Control airborne concentrations below the exposure guideline. Good general ventilation sufficient for most operations.

RESPIRATORY PROTECTION: In misty atmospheres, use an approved mist respirator. If respiratory irritation is experienced, use an approved air-purifying respirator.

(Continued on page 4 , over)

(R) Indicates a Trademark of The Dow Chemical Company

* An Operating Unit of The Dow Chemical Company

Product code: 15216

Page: R-1

Product Name: CAUSTIC SODA SOLUTION 50%

Effective Date: 06/14/90 Date Printed: 01/06/92

MSDS:000101

REGULATORY INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U.S. REGULATIONS

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard

CANADIAN REGULATIONS

The Workplace Hazardous Materials Information System (W.H.M.I.S.) Classification for this product is:

E

The Transportation of Dangerous Goods Act (T.D.G.A.) classification for this product is:

Sodium Hydroxide, Solution/Class 8, (9.2)/UN1824/II

(R) Indicates a Trademark of The Dow Chemical Company
The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.

* An Operating Unit of The Dow Chemical Company

WEST POINT PEPPERELL, INC.
CHEMICAL EVALUATION NOTICE

OSHA RATING: HAZARDOUS

23-APR-92

The MSDS for the following product has been evaluated by the Research Center and the product is approved for use:

CHEMICAL NAME: POLYBINDER 359NR4
VENDOR: MORTON INTERNATIONAL
APPROVAL NO. AP-014-HC
FACILITY: CFP-P24
REQUESTED BY: MARK MULLINS

** THIS CEN APPLIES ONLY TO THE MSDS DATED: 06/29/89 **

1. This CEN applies to the MSDS you sent to us, and should be attached to the copy you kept.
Please check the date on your MSDS for this product and eliminate any older versions.

BEST COPY AVAILABLE

Material Safety Data Sheet

SECTION 1: PRODUCT INFORMATION

NAME: POLYBINDER 359NR4
CHEMICAL DESCRIPTION: ACRYLIC EMULSION
USE: TEXTILE FINISHING
MORTON MSDS NUMBER: P001396-MCDGRE
APPEARANCE AND ODOR: MILKY-WHITE LIQUID; MILD ODOR
EMERGENCY TELEPHONE: 803-244-5351 (24 HOURS/DAY)
PRODUCT INFORMATION: 803-244-5351 EXT. 236
DIVISION: MORTON CHEMICAL
EFFECTIVE DATE: 06/29/89
SUPERCEDES DATE: 06/29/89

SECTION 2: HAZARDOUS INGREDIENTS

A HAZARD EVALUATION OF THIS PRODUCT HAS BEEN PERFORMED. THIS PRODUCT IS NOT CONSIDERED TO BE HAZARDOUS UNDER THE CRITERIA OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

SECTION 3: EMERGENCY AND FIRST AID PROCEDURES

IF THE PERSON IS DROWSY OR UNCONSCIOUS, DO NOT GIVE ANYTHING BY MOUTH. OR LEAVE ALONE. NEVER GIVE ANYTHING TO DRINK TO A PERSON WHO IS CONVULSING OR HAS NO GAG REFLEX. LOOSEN TIGHT FITTING CLOTHING, CLEAR THE AIRWAY, AND KEEP THE PERSON WARM.

EYE CONTACT:

FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION DEVELOPS, CONSULT A PHYSICIAN.

SKIN CONTACT:

CONTACT WITH THE SKIN DOES NOT NORMALLY REQUIRE MEDICAL ATTENTION. HOWEVER, IT IS ADVISABLE TO FLUSH THE AFFECTED AREA WITH PLENTY OF WATER TO REMOVE ANY PRODUCT RESIDUE.

INHALATION:

EXPOSURE BY INHALATION DOES NOT NORMALLY PRODUCE ADVERSE EFFECTS. THEREFORE, MEDICAL ATTENTION IS NOT USUALLY REQUIRED FOLLOWING EXPOSURE.

INGESTION:

CALL A POISON CONTROL CENTER, EMERGENCY ROOM, OR PHYSICIAN. UNLESS ADVISED OTHERWISE, INDUCE VOMITING BY GIVING EITHER SYRUP OF IPECAC FOLLOWED BY 2 GLASSES OF WATER OR BY STICKING FINGER DOWN THROAT.

NOTE TO PHYSICIAN:

NO SPECIFIC ANTIDOTE IS KNOWN. THERAPY IS DIRECTED AT PREVENTING ABSORPTION, ADMINISTERING TO THE SYMPTOMS AS THEY OCCUR, AND PROVIDING SUPPORTIVE THERAPY.

SECTION 4: HEALTH EFFECTS SUMMARY

PRIMARY ROUTE(S) OF EXPOSURE: EYE - YES SKIN - YES INHALATION - NO

Material Safety Data Sheet

EYE CONTACT:

NO ADVERSE EFFECTS ARE EXPECTED FOLLOWING INCIDENTAL CONTACT WITH THE OCULAR TISSUES.

SKIN CONTACT:

NO ADVERSE EFFECTS ARE EXPECTED FOLLOWING INCIDENTAL CONTACT WITH THE SKIN.

INHALATION:

UNDER NORMAL CONDITIONS OF USE, NO ADVERSE EFFECTS ARE EXPECTED.

INGESTION:

CAN CAUSE NAUSEA, VOMITING, AND GASTROINTESTINAL UPSET (e.g. DIARRHEA).

ADDITIONAL EFFECTS:

DEPENDING ON THE ROUTE, FREQUENCY, AND DURATION OF EXPOSURE, TOXICITY MAY OCCUR IN THE FOLLOWING ORGANS AND/OR SYSTEMS:
NONE KNOWN.

AGGRAVATION OF EXISTING CONDITIONS:

EXPOSURE TO THIS PRODUCT IS NOT EXPECTED TO CONTRIBUTE TO, WORSEN, OR AGGRAVATE ANY EXISTING MEDICAL CONDITIONS.

SECTION 5: TOXICOLOGIC INFORMATION

THIS SECTION PROVIDES RELEVANT INFORMATION WITH REGARD TO THE TOXICITY OF THE "PURE" FORM OF THE COMPONENT(S) IDENTIFIED IN SECTION 2, AS WELL AS THE RESULTS OF ANY TOXICITY STUDIES PERFORMED ON THE PRODUCT. THOUGH DETAILED, THIS INFORMATION CAN BE SUBJECT TO MISINTERPRETATION. IT IS, THEREFORE, ESSENTIAL THAT THE FOLLOWING INFORMATION BE INTERPRETED BY INDIVIDUALS TRAINED IN ITS EVALUATION.

PRODUCT TOXICITY INFORMATION:

TOXIC EFFECTS:

BASED ON THE RESULTS OF STUDIES PERFORMED ON SIMILAR PRODUCTS, THIS PRODUCT WOULD NOT BE CONSIDERED TO BE AN EYE OR SKIN IRRITANT.

SECTION 6: OCCUPATIONAL CONTROL PROCEDURES

EYE PROTECTION:

WEAR CHEMICAL SPLASH GOGGLES.

SKIN PROTECTION:

TO PREVENT SKIN CONTACT, WEAR PROTECTIVE CLOTHING AND APPROPRIATE IMPERVIOUS GLOVES. BECAUSE A VARIETY OF PROTECTIVE GLOVES EXIST, ALWAYS CONSULT GLOVE MANUFACTURER TO DETERMINE THE PROPER TYPE FOR SPECIFIC OPERATION.

Material Safety Data Sheet

RESPIRATORY PROTECTION:

RESPIRATORY PROTECTION IS NOT USUALLY REQUIRED UNDER NORMAL CONDITIONS OF USE.

VENTILATION:

MINIMIZE EXPOSURE BY PROVIDING ADEQUATE VENTILATION. GENERAL (DILUTION) VENTILATION MAY BE ACCEPTABLE. HOWEVER, LOCAL EXHAUST VENTILATION IS RECOMMENDED WHEN VAPORS, MISTS, OR DUSTS CAN BE RELEASED.

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING, ESPECIALLY BEFORE EATING, DRINKING, SMOKING, OR USING RESTROOM FACILITIES. CONTAMINATED CLOTHING AND SHOES SHOULD BE THOROUGHLY CLEANED AND DRIED BEFORE REUSE.

SECTION 7: FIRE PROTECTION INFORMATION

FLASH POINT: > 200 F, 93 C TEST METHOD: SETAFLASH CLOSED CUP

EXPLOSIVE LIMITS: LEL (%) - NOT APPLICABLE UEL (%) - NOT APPLICABLE

AUTOIGNITION TEMPERATURE: -NOT APPLICABLE

EXTINGUISHING MEDIA:

THIS IS A WATER-BASED PRODUCT AND IS NOT EXPECTED TO BURN UNTIL ALL THE WATER HAS BOILED AWAY. THE RESIDUAL SOLIDS AND/OR PRODUCT CONTAINER MAY SUPPORT COMBUSTION. USE WATER, FOAM, DRY CHEMICAL, OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES:

FIRE FIGHTERS AND OTHERS WHO MAY BE EXPOSED TO THE PRODUCTS OF COMBUSTION SHOULD BE EQUIPPED WITH NIOSH APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) AND FULL PROTECTIVE CLOTHING.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

NONE KNOWN.

SECTION 8: REACTIVITY DATA

STABLE UNDER NORMAL CONDITIONS OF STORAGE AND USE: YES

MATERIALS TO AVOID:

NONE KNOWN.

HAZARDOUS POLYMERIZATION:

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

THERMAL DECOMPOSITION PRODUCTS:

IF HEATED TO HIGH TEMPERATURES OR EXPOSED TO AN OPEN FLAME, THIS PRODUCT MAY EMIT THE FOLLOWING COMPOUNDS:

Material Safety Data Sheet

SMOKE, SOOT, & TOXIC FUMES (e.g. CARBON DIOXIDE & CARBON MONOXIDE).

SECTION 9: SPILL AND LEAK PROCEDURES

RESPONSE TO SPILLS:

STOP DISCHARGE AND CONTAIN SPILL OR CONTAMINATED MATERIAL USING A DIKE OR BARRIER. IF A SUBSTANTIAL QUANTITY IS SPILLED AND CAN BE PUMPED, RECOVER WITH PUMPING EQUIPMENT OR A VACUUM TRUCK. EXPLOSION-PROOF EQUIPMENT SHOULD BE USED IF THIS PRODUCT IS FLAMMABLE OR COMBUSTIBLE (SEE SECTION 7). OTHERWISE, USE AN ABSORBENT SUCH AS FULLER'S EARTH, CLAY, OR OTHER APPROPRIATE SYNTHETIC ABSORBENT. PLACE CONTAMINATED MATERIAL IN A SUITABLE CONTAINER FOR FURTHER HANDLING AND DISPOSAL. APPROPRIATE SAFETY MEASURES AND PROTECTIVE EQUIPMENT SHOULD BE USED (SEE SECTION 6).

DO NOT FLUSH TO SEWER, STREAM, OR OTHER BODIES OF WATER UNLESS AUTHORIZED TO DO SO BY APPROPRIATE GOVERNMENT OFFICIAL.

PRECAUTIONS:

IF THE AIRBORNE CONCENTRATION EXCEEDS ESTABLISHED EXPOSURE LIMITS, EVACUATE EMPLOYEES AND VENTILATE THE AREA.

A SUPPLIED AIR RESPIRATOR OR SELF-CONTAINED BREATHING APPARATUS (SCBA), SHOULD BE USED FOR ENTRY INTO ENCLOSED SPACES, OR IN AREAS WITH INADEQUATE VENTILATION.

SPILL NOTIFICATION:

THIS PRODUCT MAY CONTAIN ONE OR MORE HAZARDOUS SUBSTANCES LISTED EITHER BY THE U.S. EPA (CERCLA, 40 CFR 302.4) OR BY THE U.S. DOT (49 CFR 172.101), FOR WHICH A "REPORTABLE QUANTITY" (RQ) HAS BEEN ESTABLISHED. IF A QUANTITY EQUAL TO OR GREATER THAN THE ESTABLISHED RQ IS RELEASED INTO THE ENVIRONMENT, THE NATIONAL RESPONSE CENTER (NRC) AT 800-424-8802 MUST BE NOTIFIED IMMEDIATELY. THIS PRODUCT MAY ALSO CONTAIN AN EXTREMELY HAZARDOUS SUBSTANCE (SEE SECTION 13), WHICH MAY REQUIRE ADDITIONAL REPORTING UNDER SARA TITLE III (40 CFR 355.40). OTHER FEDERAL, STATE, AND LOCAL REPORTING REGULATIONS MAY APPLY.

DISPOSAL METHODS:

IF DISCARDED IN ITS ORIGINAL UNUSED FORM, THIS PRODUCT DOES NOT MEET THE DEFINITION OF A RCRA HAZARDOUS WASTE UNDER 40 CFR 261. NEVERTHELESS, IT SHOULD BE MANAGED (STORED/TREATED/DISPOSED/ETC.) AT AN AUTHORIZED FACILITY, IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS. BE SURE TO CONTACT APPROPRIATE GOVERNMENT ENVIRONMENTAL AGENCIES IF FURTHER DISPOSAL GUIDANCE IS REQUIRED.

OF THE METHODS OF DISPOSAL CURRENTLY AVAILABLE, IT IS RECOMMENDED THAT AN ALTERNATIVE BE SELECTED ACCORDING TO THE FOLLOWING ORDER OF PREFERENCE, BASED UPON ENVIRONMENTAL ACCEPTABILITY:

- (1) RECYCLE OR REWORK IF AT ALL FEASIBLE,
- (2) INCINERATE AT AN AUTHORIZED FACILITY,

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ial Safety Data Sheet

- (3) TREAT AT AN ACCEPTABLE WASTE TREATMENT FACILITY, OR
(4) LANDFILL AT AN APPROVED FACILITY (SOLIDIFICATION OR FIXATION MAY BE REQUIRED PRIOR TO DISPOSAL).

SECTION 10: SPECIAL PRECAUTIONS

RECOMMENDED STORAGE PRACTICE AND CONDITIONS:

PROTECT FROM FREEZING. STORE IN COOL, DRY, WELL VENTILATED AREA.

DO NOT STORE ABOVE: 120 F, 49 C

CONTAINER USE PROCEDURES:

NO SPECIAL PRECAUTIONS ARE NEEDED. FOLLOW GOOD MANUFACTURING AND HANDLING PRACTICES.

EMPTY CONTAINER PRECAUTIONS:

THIS CONTAINER CAN BE HAZARDOUS WHEN EMPTY, BECAUSE IT CAN RETAIN PRODUCT RESIDUES. THEREFORE, DO NOT REUSE CONTAINER FOR FOOD, CLOTHING, OR PRODUCTS FOR HUMAN OR ANIMAL CONSUMPTION OR WHERE SKIN CONTACT MAY OCCUR.

SECTION 11: PHYSICAL DATA

% NON-VOLATILES (BY WEIGHT):	43
pH:	2.5
VAPOR DENSITY (AIR=1):	NOT APPLICABLE
SOLUBILITY IN WATER:	MISCIBLE OR DISPERSIBLE
EVAPORATION RATE:	NOT ESTABLISHED
VAPOR PRESSURE (mmHg @ 25 DEGREES C):	24
SPECIFIC GRAVITY (WATER=1):	1
BOILING POINT (@ 1 ATM):	212 F, 100 C

NOTE: THE PHYSICAL DATA PRESENTED ABOVE ARE TYPICAL VALUES AND SHOULD NOT BE CONSTRUED AS A SPECIFICATION.

SECTION 12: LABEL AND TRANSPORTATION INFORMATION

DOT SHIPPING NAME:	NOT REGULATED
DOT LABEL:	NOT APPLICABLE
DOT IDENTIFICATION NO.:	NOT APPLICABLE
MORTON PRECAUTIONARY LABEL NO.:	L111

SECTION 13: REGULATORY INFORMATION

TOXIC SUBSTANCE CONTROL ACT (TSCA)

THE CHEMICAL COMPONENTS OF THIS PRODUCT ARE CONTAINED ON THE SECTION 8(B) CHEMICAL SUBSTANCE INVENTORY LIST (40 CFR 710).

SARA TITLE III INFORMATION

SECTION 313 - TOXIC CHEMICALS

Safety Data Sheet

PURSUANT TO SECTION 313 OF SARA TITLE III, THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL IN EXCESS OF 1 PERCENT OF THE MIXTURE (0.1 PERCENT, IF THE LISTED TOXIC CHEMICAL IS A CARCINOGEN).

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES
PURSUANT TO SECTION 302 OF SARA TITLE III, THIS PRODUCT DOES NOT CONTAIN AN EXTREMELY HAZARDOUS SUBSTANCE.

SECTION 311/312 - HAZARD CATEGORIES
- PURSUANT TO SECTION 311/312 OF SARA TITLE III, THE PHYSICAL AND HEALTH HAZARD CATEGORIES FOR THIS PRODUCT ARE IDENTIFIED BELOW:

FIRE HAZARD: NO
SUDDEN RELEASE OF PRESSURE HAZARD: NO
REACTIVITY HAZARD: NO
IMMEDIATE (ACUTE) HEALTH HAZARD: NO
DELAYED (CHRONIC) HEALTH HAZARD: NO

HAZARDOUS MATERIALS INFORMATION REVIEW REGULATIONS - CANADA

THIS MATERIAL SAFETY DATA SHEET PROVIDES INFORMATION THAT COMPLIES WITH THE REQUIREMENTS SET FORTH UNDER THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS).

CLAIM FOR EXEMPTION REGISTRY NO.: NOT APPLICABLE
EXPIRATION DATE: NOT APPLICABLE

SECTION 14: USERS RESPONSIBILITY

A BULLETIN SUCH AS THIS CANNOT BE EXPECTED TO COVER ALL POSSIBLE INDIVIDUAL SITUATIONS. AS THE USER HAS THE RESPONSIBILITY TO PROVIDE A SAFE WORKPLACE, ALL ASPECTS OF AN INDIVIDUAL OPERATION SHOULD BE EXAMINED TO DETERMINE IF, OR WHERE, PRECAUTIONS - IN ADDITION TO THOSE DESCRIBED HEREIN - ARE REQUIRED. ANY HEALTH HAZARD AND SAFETY INFORMATION CONTAINED HEREIN SHOULD BE PASSED ON TO YOUR CUSTOMERS OR EMPLOYEES, AS THE CASE MAY BE. MORTON THIokol, INC. MUST RELY ON THE USER TO UTILIZE THE INFORMATION WE HAVE SUPPLIED TO DEVELOP WORK PRACTICE GUIDELINES AND EMPLOYEE INSTRUCTIONAL PROGRAMS FOR THE INDIVIDUAL OPERATION.

DISCLAIMER OF LIABILITY

THE INFORMATION CONTAINED HEREIN IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE. HOWEVER, SINCE THE CONDITIONS OF HANDLING AND USE ARE BEYOND OUR CONTROL, WE MAKE NO GUARANTEE OF RESULTS, AND ASSUME NO LIABILITY FOR DAMAGES INCURRED BY USE OF THIS MATERIAL. ALL CHEMICALS MAY PRESENT UNKNOWN HEALTH HAZARDS AND SHOULD BE USED WITH CAUTION. ALTHOUGH CERTAIN HAZARDS ARE DESCRIBED HEREIN, WE CANNOT GUARANTEE THAT THESE ARE THE ONLY HAZARDS WHICH EXIST. FINAL DETERMINATION OF SUITABILITY OF THE CHEMICAL IS THE SOLE RESPONSIBILITY OF THE USER. USERS OF ANY CHEMICAL SHOULD SATISFY THEMSELVES THAT THE CONDITIONS AND METHODS OF USE ASSURE THAT THE CHEMICAL IS USED

erial Safety Data Sheet

SAFELY. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS. IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

NOTHING CONTAINED HEREIN IS TO BE CONSTRUED AS A RECOMMENDATION FOR USE IN VIOLATION OF ANY PATENTS OR OF APPLICABLE LAWS OR REGULATIONS.

IF YOU HAVE QUESTIONS WITH REGARD TO THE INFORMATION PRESENTED IN THIS DOCUMENT, CONTACT:

DAVID B. WIENCKOWSKI, D.A.B.T.
MANAGER, MATERIAL SAFETY DATA SHEETS
312-807-2000

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1. Mistakes in the program _____

[illegible]

2. Problems I had while using the program _____

[illegible]

3. I would like to see these things added to the program _____

4. I would like to see these things taken out of the program _____

5. General comments and suggestions _____

USER SURVEY

- | | | | | |
|--|--------------------------------------|---|---------------------------------------|---------------------------------------|
| 1. Overall, how do you rate the program?
(On a scale of 1 to 5) | BAD
1 2 3 4 5 | BORING
1 2 3 4 5 | GOOD
1 2 3 4 5 | EASY
1 2 3 4 5 |
| 2. Do you think the letters on the computer screen are easy to read? | NO
1 2 3 4 5 | YES
1 2 3 4 5 | | |
| 3. Do you think the highlighting on the computer screen was helpful? | NO
1 2 3 4 5 | YES
1 2 3 4 5 | | |
| 4. Did you understand the ordering of the computer screens? | NO
1 2 3 4 5 | YES
1 2 3 4 5 | | |
| 5. Do you think the wording in the program was consistent? | NO
1 2 3 4 5 | YES
1 2 3 4 5 | | |
| 6. Are the words used in the program similar to words you use during work? | NO
1 2 3 4 5 | YES
1 2 3 4 5 | | |
| 7. Do you think the messages on the computer screen are confusing? | NO
1 2 3 4 5 | YES
1 2 3 4 5 | | |
| 8. Does the computer always let you know what it is doing? | NO
1 2 3 4 5 | | | |

- | | | | | | | |
|-----|---|---------|---|---|---|----------|
| 9. | If you got error messages, do you think the error messages were helpful? | NO
1 | 2 | 3 | 4 | YES
5 |
| 10. | Do you think the program is easy to learn? | NO
1 | 2 | 3 | 4 | YES
5 |
| 11. | Do you think the buttons are easy to learn by trial and error? | NO
1 | 2 | 3 | 4 | YES
5 |
| 12. | Do you think it is easy to remember the names and uses of the buttons? | NO
1 | 2 | 3 | 4 | YES
5 |
| 13. | If you clicked on the help button, do you think that the computer help screen you got to was helpful? | NO
1 | 2 | 3 | 4 | YES
5 |
| 14. | Do you think the computer follows your commands fast enough? | NO
1 | 2 | 3 | 4 | YES
5 |
| 15. | Do you think it is easy to get stuck in the program? | NO
1 | 2 | 3 | 4 | YES
5 |
| 16. | Do you think the program makes it easy to correct your mistakes? | NO
1 | 2 | 3 | 4 | YES
5 |

- | | | | | | | |
|-----|---|---------|---|---|---|----------|
| 17. | After using the program, do you know more about Material Safety Data Sheets? | NO
1 | 2 | 3 | 4 | YES
5 |
| 18. | After using the program, do you think that you can use MSDSs better while working on the plant floor? | NO
1 | 2 | 3 | 4 | YES
5 |
| 19. | Would you use this program without being asked to by your supervisor? | NO
1 | 2 | 3 | 4 | YES
5 |
| 20. | Did the special lettering and shading of the Hot Words help you find them? | NO
1 | 2 | 3 | 4 | YES
5 |
| 21. | Did the using the highlight button help you find the Hot Words? | NO
1 | 2 | 3 | 4 | YES
5 |
| 22. | Did you understand the examples from the actual MSDS's? | NO
1 | 2 | 3 | 4 | YES
5 |
| 23. | Did the sounds with the program bother you? | NO
1 | 2 | 3 | 4 | YES
5 |
| 24. | Do you think that the animation was interesting? | NO
1 | 2 | 3 | 4 | YES
5 |
| 25. | Do you think that the animation was useful in helping you understand and learn the words? | NO
1 | 2 | 3 | 4 | YES
5 |

26. Do you think that the button practice screens were helpful? NO 1 2 3 4 YES 5

27. Do you think that there were too many examples of actual MSDSs in the program? NO 1 2 3 4 YES 5

28. Do you think that having Hot Words on the examples was helpful? NO 1 2 3 4 YES 5

29. Would you like to see more or less hot words on the example cards?

MORE HOT WORDS

SAME AMOUNT

LESS HOT WORDS

30. Please list any other things you would like to be included on the help screen.

31. Do you have any other suggestions about the program?

SECTION 2

STUBBY
Workplace Vocabulary Builder

ERIC
Full Text Provided by ERIC

STUBBY PRE/POST TEST

Name _____

					J		D		E	
							TAXES/DEDUCTIONS		YEAR TO	
dd	C	F	B	H			N	O	P	Q
DESCRIPTION	RATE	HOURS	EARNINGS	YEAR TO DATE			R	S	T	U
Regular Earn	ee 10.00	V 40.00	400.00	15200.00	FEDERAL TAX					
Overtime Earn	98 5.00	W 00	00	0	FICA/MED					
40 D/S Time	ff 10.00	Z 100	1000	3800.00	SOUTH CAROLIN					
19 Holiday Pay	hh 10.00	100	1000	3800.00	6C MED CAF NTS					
28 Shift Prem	jj 05	KK 40.00	200	760.00	6F LIF CAF NTS					
					55 A&S INS					
					51 UV					
					85 WPP CR ASSN					

CURRENT	EARNINGS	TAXES	DEDUCTIONS	NET PAY	PAY PERIOD	CHECK NUMBER	AMOUNT OF C
aa 1645800	44200	bb 740610	cc 12359	22 22406	9/14/93	197981	1 22
YEAR TO DATE				V 792831	9/21/93	AT	G 22

Beside the numbers below, write the letter of the place on the check stub that fits the description given.

- Find the total amount you will take home this pay period.
- Find the column which shows the number of hours you worked this pay period.
- Find the column which shows both the taxes and the deductions you have paid so far for the entire year.
- Find the column which shows the names of the different kinds of taxes and deductions.
- Find the total amount of Deductions taken from your check this pay period.
- Find the amount being deducted from this check for your WPP Credit Union savings account.
- Find the number of hours you were paid for Down-Stop time.
- Find the total amount you earned this pay period before anything was deducted.
- Find the total amount of money you have taken home this year.

10. You want to find out how much you made per hour for your regular pay this pay period. Which operation would you choose to find the answer?

- ☐ A. Overtime earnings amount times the number of hours overtime worked
- ☐ B. Earnings amount divided by number of hours
- ☐ C. Year to Date regular earnings amount minus regular earnings amount for the period.

11. You decide to enroll in the company life insurance program. This means that \$1.40 will be deducted from your check each week. How can you find your net pay for the week?

- ☐ A. Net pay amount minus \$1.40
- ☐ B. Earnings amount minus \$1.40
- ☐ C. Earnings amount divided by \$1.40

12. Where will you find the amount of your check written on the check stub?

- ☐ A. The amount is the first one in the "Earnings" column.
- ☐ B. Nowhere. You have to add everything up yourself.
- ☐ C. The amount is located both in the net pay box and in the box headed "Amnt of check".

13. How can you find out the total number of hours you were paid for this week?

- ☐ A. Add up regular hours, D/S time, and holiday pay.
- ☐ B. Add up all the numbers in the "Hours" column.
- ☐ C. Subtract overtime hours from regular earnings hours, then add D/S time.

14. Which insurance option builds a cash value which you may choose to keep even if you leave the company?

- ☐ A. Life Cafeteria NTS
- ☐ B. Medical Cafeteria NTS
- ☐ C. Universal Life

15. Which holiday would NOT be eligible for holiday pay?

- ☐ A. Memorial Day
- ☐ B. Mother's Day
- ☐ C. Easter Monday

TobyCat Productions
announces:
Workplace Vocabulary Builder

Workplace Vocabulary Builder is an easy-to-use piece of software that is the perfect tool for helping your employees with workplace specific vocabulary instruction. As a Hypercard-based program it acts as a template that allows you to input your workplace specific vocabulary. You can set different levels of vocabulary difficulty and determine what level of mastery an employee must reach before the program automatically moves the employee to the next level. *Workplace Vocabulary Builder* also allows you to input your own sentences for use in vocabulary comprehension exercises. In this way you also control the level of difficulty and construct your own sentences at the knowledge, comprehension, application, etc. levels. **Add** and delete words and/or sentences as much as you like.

In addition, the program automatically keeps a record of each employee's performance.

In *Workplace Vocabulary Builder* employees choose from five different activities in working with the words and definitions you have chosen to input.

Word Review -- Here the employee can browse through the words and definitions that s he will be studying in the other activities.

Multiple Choice -- Here a definition is presented and the employee must choose which of three presented words is correct. [Words presented are chosen randomly from the current list the employee is studying. Missed words are recycled back into future presentations.]

Word Knowledge -- This makes it a bit harder. Now, using the entire list, the employee must chose which word goes with the presented definition.

Word Challenge! -- This is a fun game for review and practice. In Round #1 the employee must get the on-screen character to "shoot" the correct word given three choices, to score points. Speed and accuracy count. In Round #2 one of the workplace specific sentences you entered appears with a blank for the word. Once again the employee must "shoot" the correct word from four choices, to score points.

Sentence Completion -- Finally, the employee is asked to type in the correct word to complete the work-specific sentence [that you have created]. Performance during this exercise is monitored and recorded automatically. Based on the mastery criteria you have selected the employee is moved back to review or on to the next level of difficulty when finished with this activity.

Workplace Vocabulary Builder is the ideal program for building employees' job-specific workplace vocabulary because:

- 1) You can customize it. You decide on the vocabulary words, the sentences and their difficulty, and the desired level of mastery.
- 2) With a sequence of progressively harder vocabulary lists and teacher set mastery level criteria, you control and can individualize programs.
- 3) With a series of progressively harder words and choice points for reviewing, students can further individualize their own programs.
- 4) Students will find it fun and non-intimidating. Students at our pilot site loved using it.
- 5) You can afford it. A site license for 25 users is only \$495.

For more information, or to order:

write: TobyCat Productions, 223 Riggs Drive, Clemson SC 29631.

To order a site license send \$500 (\$495 plus shipping and handling).

Make checks payable to TobyCat Productions.

call: Bill Fisk at 803-656-5119 or 803-654-7437

fax: to Bill Fisk at 803-656-1322.

(Macintosh version available; DOS Version under development)

Section: Multiple Choice Number right: 1 of 16

The temperature at which a liquid becomes hot enough so that it will boil. This is the temperature where the liquid turns to a gas.

Choice 1 Dose	Choice 2 Boiling Point	Choice 3 Irritant
------------------	---------------------------	----------------------

Click on the word or phrase that best fits the definition shown above.

Correct	Correct Answer
Incorrect	

SECTION 3

Interactive Knowledge



The TEXTdisc

A Reading and Math Disc for the Textile Workplace

Overview

The TEXTdisc is a CD-ROM disc containing multimedia workplace literacy courseware. It is designed to help textile employees improve their reading and math skills.

A videotape companion provides an introduction to The TEXTdisc and is designed to motivate employees to complete the program.

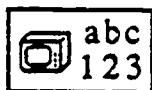
The TEXTdisc CD-ROM courseware is developed around textile industry content and has a reading component as well as a math component. In both tracks, activities are designed to help employees develop the critical thinking skills necessary to be better prepared for changes in the workplace.

The TEXTdisc courseware is designed to give the employee control of the learning experience. The courseware is for any employee who is functioning at or above a fifth-grade reading level and has some knowledge of basic math.

Highlights

- Basic reading and math skills instruction using content relevant to the textile industry and the workforce.
- Critical thinking skills introduced throughout both the reading and math components.
- High-quality digital audio, full-color digitized photographs and animation to enhance the instruction.
- Student management component records student scores and time on task.

Instructional Outline



Video Introduction to the Courseware

A short videotape (5 - 8 mins.) provides an introduction to the program. The tape is a motivational piece on learning (importance of learning, new ways to learn with computer, etc.). It also introduces each instructional module and describes the components that make up the courseware. Following is a brief outline of the videotape.

- motivation for learning
 - why developing better basic skills is important
 - how computer can help you improve skills quickly

- overview of each module topic
 - introduce each module topic in a short, promotional format
 - incorporate a descriptive graphic image that will be used as a symbol in the courseware menus
- introduction to the courseware
 - explanation of the reading and math components
 - explanation of each skill, why it is important



Reading Component

The reading component is designed to help textile employees develop reading comprehension skills and increase their vocabulary. This section of the instruction contains five modules describing the textile industry process. Following is a list of the five module titles included on The TEXTdisc:

1. Preparing Cotton Fibers for Spinning
2. Spinning of Wool and Cotton Yarn
3. Knitting Fabric
4. Weaving Fabric
5. Fabric Finishing and Color Application

A short article (4 paragraphs) introduces each topic and is used throughout the module to teach a variety of important reading comprehension skills. Each reading module provides instruction on 5 reading steps:

Reading Module Outline

Step 1 - Before you read the article

Activity 1 - Think about what you want to learn from the article

Step 2 - Reading the article

Activity 1 - Read the article

Activity 2 - Learn about the vocabulary words

Activity 3 - Take the vocabulary test

Step 3 - Understanding the article

Activity 1 - Identify paragraph topics

Activity 2 - Make an outline

Activity 3 - Identify where to look for answers

Step 4 - Finding information in the article

Activity 1 - Scan for words

Activity 2 - Scan for answers

Activity 3 - Scan for more answers (first level inference)

Step 5 - After you read the article - what have you learned?

Activity 1 - Summarize the article

Activity 2 - Answer true / false questions

Activity 3 - Answer fill-in-the-blank questions

Activity 4 - Answer questions from Step 1



Math Component

The math component consists of 4 levels of word problems dealing with specific math skills. This section of the courseware deals with the application of known math and critical thinking skills to problems a textile employee would find on the job or in every day life. Each level is broken down into 3 or 4 programs covering whole numbers, fractions, decimals, and percents. Each program includes problems which review skills from previous levels.

The courseware includes a placement test to determine where in the math module the employee should begin. The word problems in the math component are tied in with instruction in workbooks.

There are over 400 word problems in the math component covering a variety of textile job-specific issues and everyday situations.

Math Component Outline

Level A - Whole numbers - Word Problems

- Program 1 • Adding whole numbers (object numbers, money numbers, carrying)
- Program 2 • Subtracting whole numbers (borrowing, money)
- Program 3 • Multiplying whole numbers (carrying)
- Program 4 • Dividing whole numbers (remainders)

Level B - Fractions - Word Problems

- Program 1 • Adding fractions (same denominator, different denominator, mixed numbers)
- Program 2 • Subtracting fractions (same and different denominator, mixed numbers, borrowing with same and different denominator)
- Program 3 • Multiplying fractions (mixed numbers)
- Program 4 • Dividing fractions (mixed numbers)

Level C - Decimals - Word Problems

- Program 1 • Add, subtract, multiply, divide decimals
- Program 2 • Add, subtract, multiply, divide decimals (problems require changing a fraction to a decimal)
- Program 3 • Add, subtract, multiply, divide decimals (problems that require rounding off decimals)

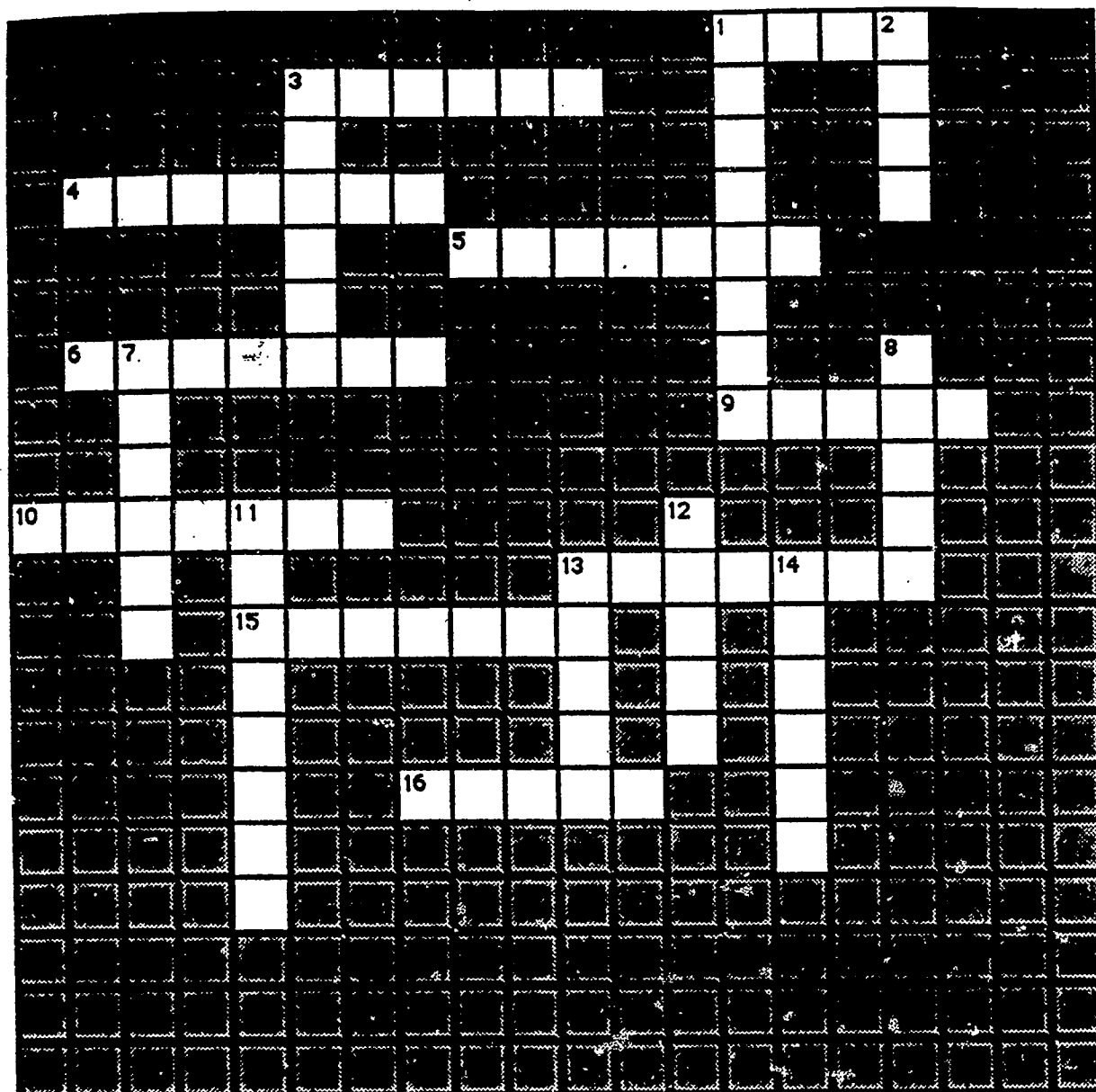
Level D - Percents - Word Problems

- Program 1 • Find part when percent and whole are known (What is 10% of 50?)
- Program 2 • Find percent when part and whole are known (What % of 50 is 5?)
- Program 3 • Find whole when percent and part are known (5 is 10% of what number?)

For more information, contact:

Literacy Systems Center
North Carolina State University
246 McKimmon Center
Raleigh, NC 27695-7401
(919) 515-7982

Interactive Knowledge, Inc.
P.O. Box 560865
Charlotte, NC 28256
(704) 549-9646



Across

1. ALLOWING SMALLER PIECES TO FALL THROUGH HOLES
3. A SINGLE STRINGLIKE PIECE OF SOMETHING
4. INTO ONE SIDE AND OUT THE OTHER SIDE
5. ALWAYS THE SAME AND UNCHANGING
6. A SET SERIES OF THINGS THAT LEAD TO AN EXPECTED RESULT
9. THE SAME
10. WORTH OR VALUE
13. MOVING BACK AND FORTH
15. NOT COMPLETE
16. TO MIX TWO OR MORE THINGS TOGETHER

Down

1. TO TAKE APART
2. KINDS
3. A PLACE FROM WHICH SOMETHING IS GOTTEN
7. TURNS IN A CIRCLE
8. TO MAKE HAPPEN
11. SOMETHING THAT IS NOT WANTED (UNCLEAN)
12. VERY THIN OR SHEER
13. TO FORM INTO A LINE
14. TO FASTEN TO SOMETHING ELSE

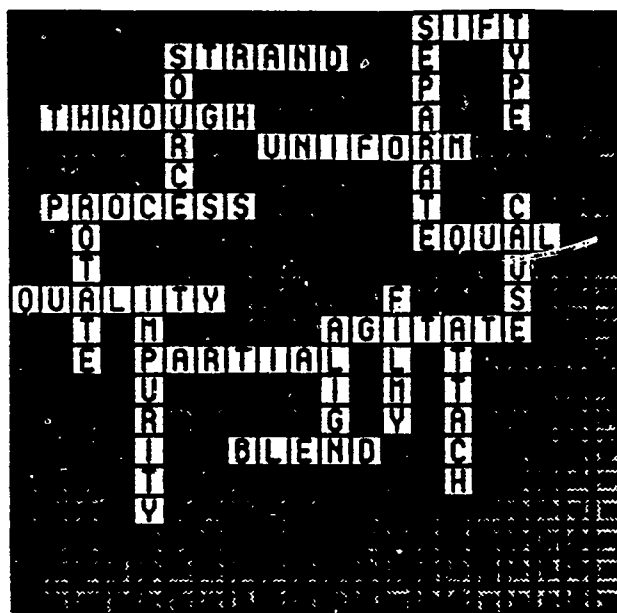
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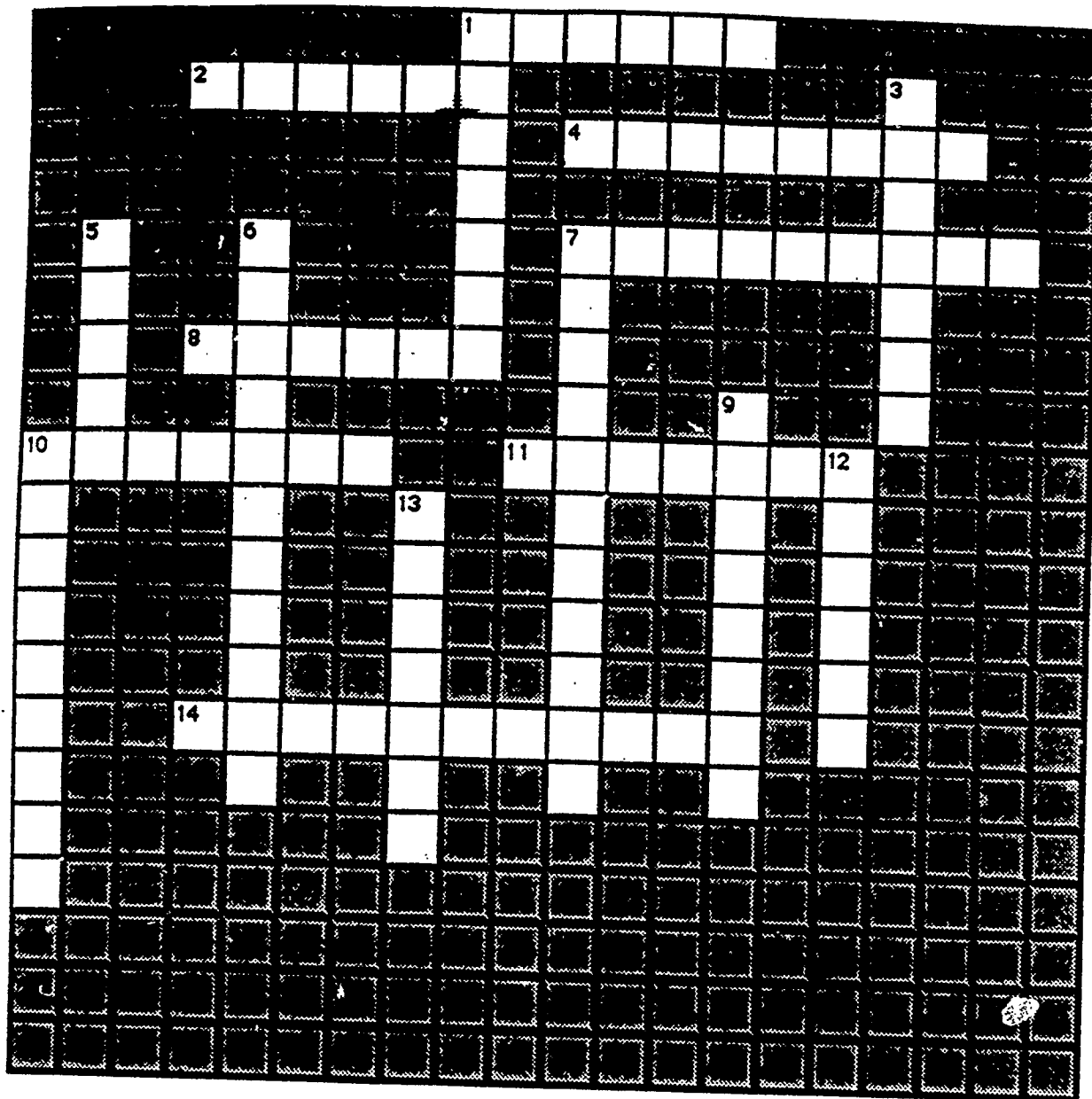
Word List: TEXTDISC 1

AGITATE
ALIGN
ATTACH
BLEND
CAUSE
EQUAL
FILMY

IMPURITY
PARTIAL
PROCESS
QUALITY
ROTATE
SEPARATE

SIFT
SOURCE
STRAND
THROUGH
TYPE
UNIFORM





Across

1. CAUSED BY SOME ACTION
2. NOT COMPLICATED
4. EXACT
7. IN AGREEMENT WITH
8. TO MAKE SMALLER
10. A MAIN OBJECT
11. TO MAKE UP
14. THE AMOUNT USED UP

Down

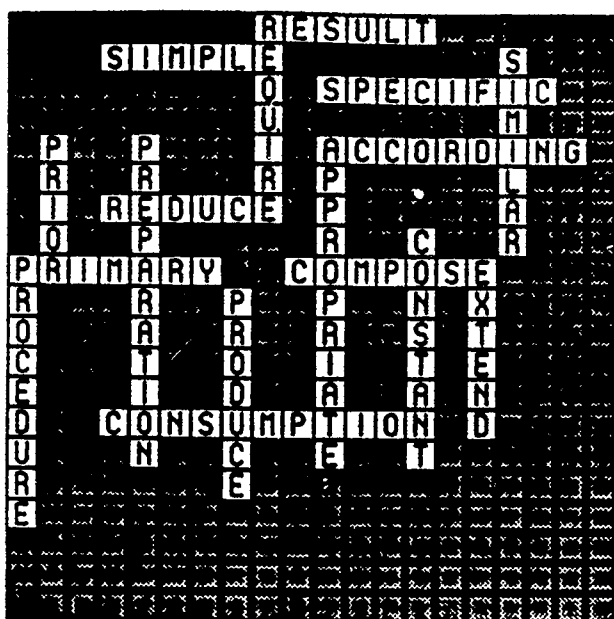
1. TO MAKE NECESSARY
3. ALIKE WITHOUT BEING THE SAME
5. COMING BEFORE IN TIME
6. THINGS DONE TO MAKE SOMETHING
7. CORRECT OR PROPER
9. NON-STOP
10. A WAY OF DOING SOMETHING
12. TO STRETCH OUT OR MAKE LONGER
13. TO MAKE

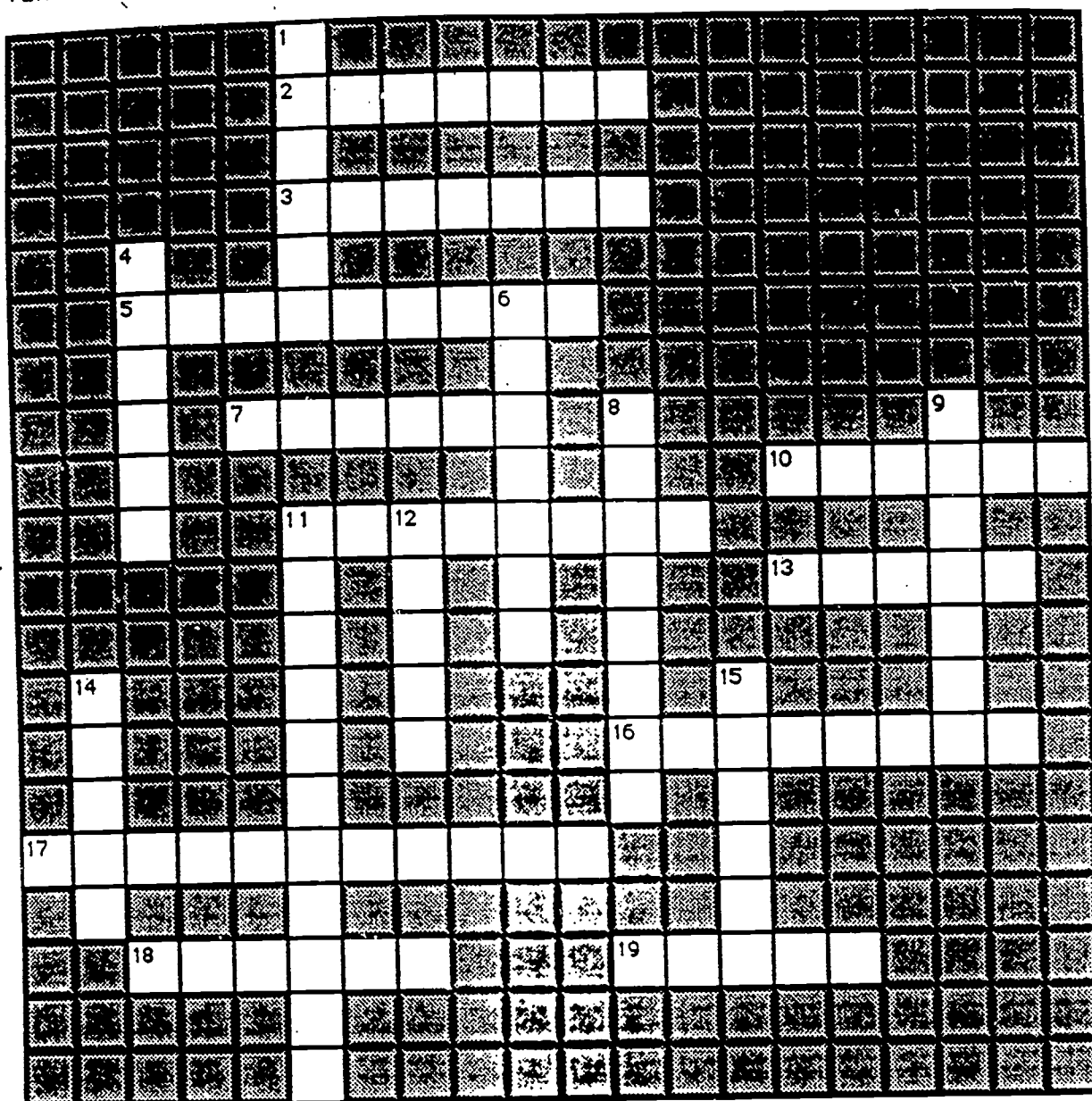
Word List: TEXTDISC 2

ACCORDING
APPROPRIATE
COMPOSE
CONSUMPTION
CONSTANT
EXTEND

PREPARATION
PRIMARY
PRIOR
PROCEDURE
PRODUCE
REDUCE

REQUIRE
RESULT
SIMPLE
SIMILAR
SPECIFIC





Across

2. A DESIGN OF FIGURE
3. WORTH OR VALUE
5. AN OUTWARD LOOK OF SOMETHING OF SOMEONE
7. USUAL OR ALIKE
10. OF THE PRESENT TIME
11. SHAPED LIKE A CIRCLE
13. VERY THIN
16. TO ADAPT EASILY
17. A PLACE WHERE A PRODUCT IS MADE
18. AN OUTLINE OR A PLAN TO MAKE SOMETHING
19. THE SPACE FROM SIDE TO SIDE

Down

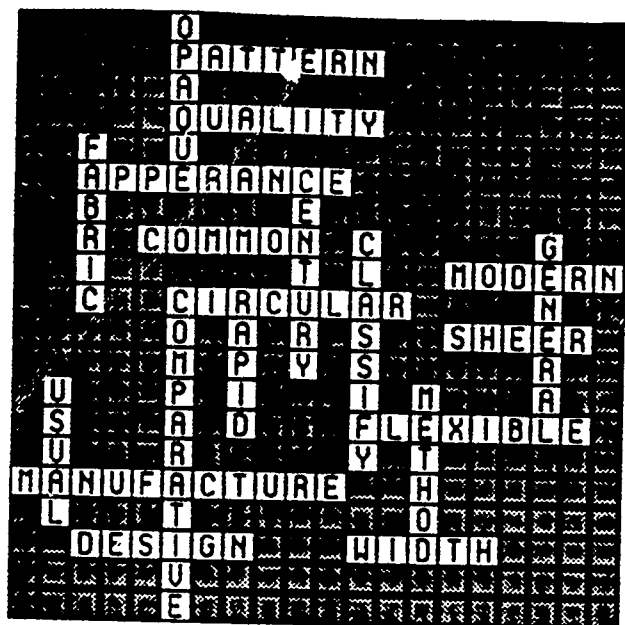
1. CAN NOT BE SEEN THROUGH
4. WOVEN OR KNIT CLOTH
6. 100 YEARS
8. TO PUT INTO A GROUP
9. COMMON OR WIDESPREAD
11. TO COMPARE WITH SOMETHING ELSE
12. FAST
14. MOST OF THE TIME
15. A SYSTEM OF DOING SOMETHING

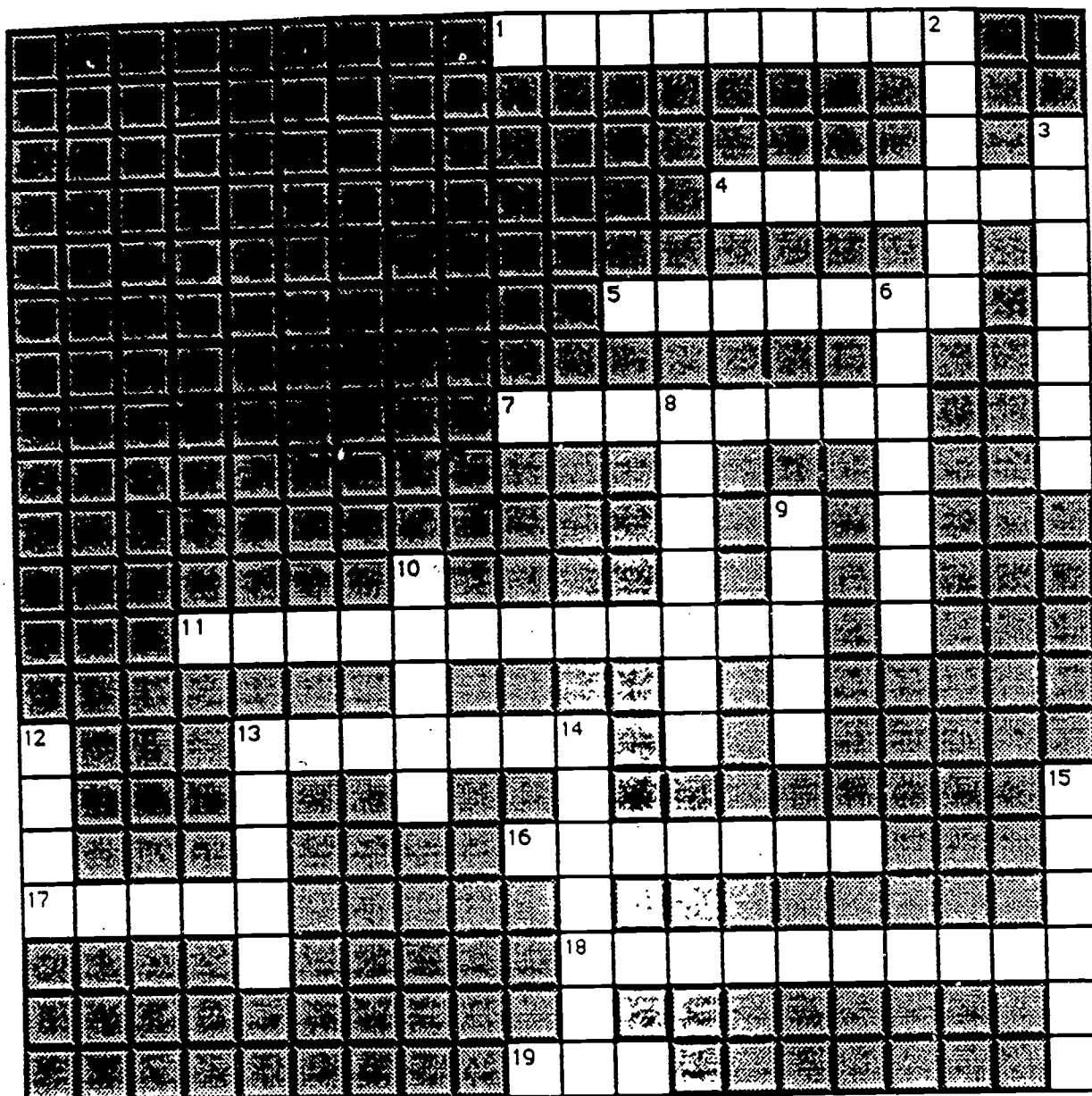
Word List: TEXTDISC 3

APPEARANCE
CENTURY
CIRCULAR
CLASSIFY
COMMON
COMPARATIVE
DESIGN

FABRIC
FLEXIBLE
GENERAL
MANUFACTURE
METHOD
MODERN
OPAQUE

PATTERN
QUALITY
RAPID
SHEER
USUAL
WIDTH





Across

1. MOST IMPORTANT
4. TO LET GO
5. TO CONTAIN AS A PART OF A WHOLE
7. TO FIND
11. TO DESCRIBE THE SPECIAL QUALITIES OF A PERSON OR THING
13. TO GET DONE
16. A NUMBER OF DIFFERENT KINDS
17. THE SPACE BETWEEN TWO LINES OR SURFACES THAT MEET
18. AN OBJECT THAT CAN BE THROWN OR SHOT FORWARD
19. A NUMBER OF THINGS THAT BELONG TOGETHER

Down

2. TO FIND A PLACE
3. TO TAKE THE PLACE OF
6. LASTING A LONG TIME
8. MAKE UP OF
9. COST VERY LITTLE
10. MAIN OR FUNDAMENTAL
12. SPACE
14. TO CHANGE
15. HE SELECTED TO SHOW WHAT OTHERS ARE LIKE
18. A LONG PAST

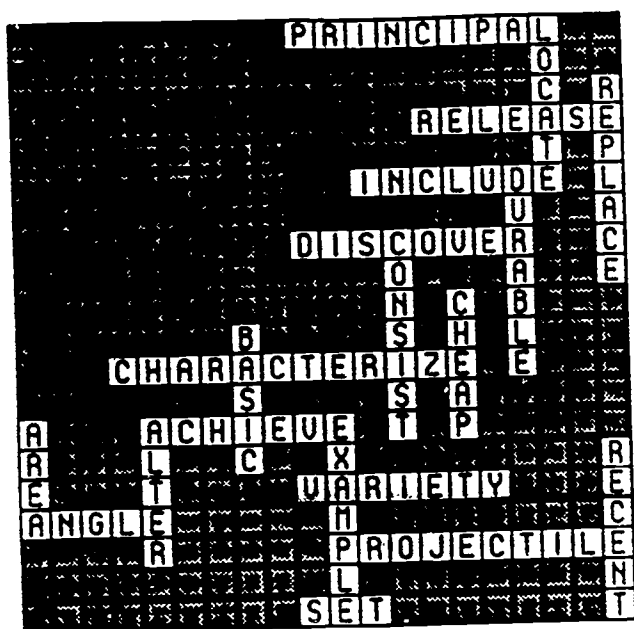
Word List: TEXTQSC 4

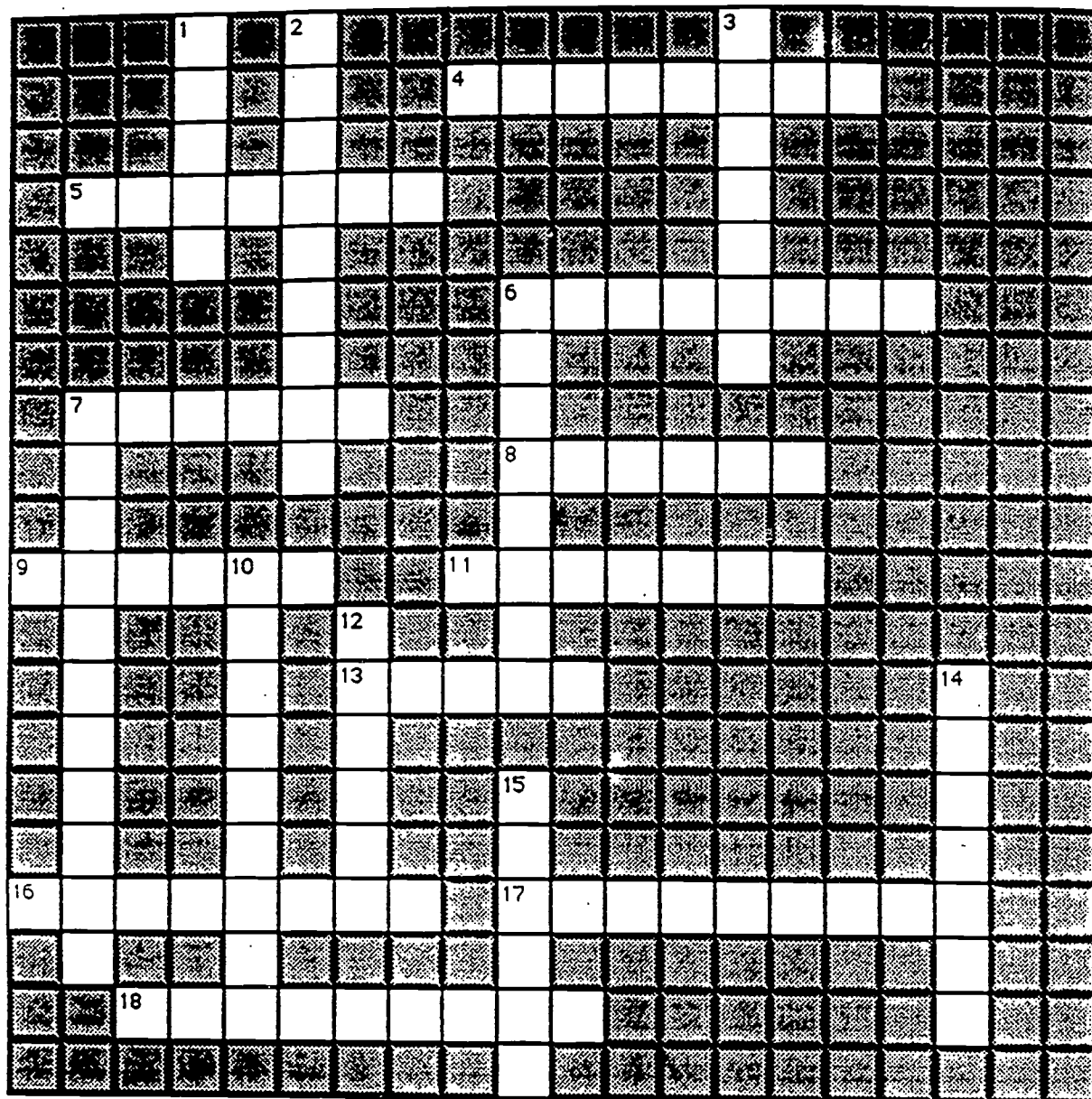
ACHIEVE
ALTER
ANGLE
AREA
BASIC
CHARACTERIZE
CHEAP

CONSIST
DISCOVER
DURABLE
EXAMPLE
INCLUDE
LOCATE
PRINCIPAL

PROJECTILE
RECENT
RELEASE
REPLACE
SET
VARIETY

Answers: TEXTDISC 4





Across

4. TO STICK OUT
5. REGULAR WAY OF DOING THINGS
6. SMOOTH OR GLOSSY
7. THE TOTAL
8. TO BECOME SMALLER
9. TO WHITEN BY THE USE OF CHEMICALS
11. THE OUTSIDE OR TOP
13. TO KEEP OFF
16. A PERSON WHO BUYS
17. A SPECIAL WAY OF DOING SOMETHING
18. TO DECIDE

Down

1. TO CLEAN OF DIRT OR OIL
2. TO WITHSTAND THE EFFECT OF SOMETHING SUCH AS FIRE
3. THE REASON FOR WHICH SOMETHING IS MADE
6. TO PUT WEIGHT AGAINST SOMETHING
7. TO PUT ON
10. TO PUT TOGETHER
12. TO MAKE
14. TO DISSOLVE OTHER THINGS
15. TO PLAN

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Word List: TEXTDISC 5

AMOUNT
APPLICATION
BLEACH
CONSUMER
CONSTRUCT
CREATE
DETERMINE

INTEND
POLISHED
PRESSURE
PROTRUDE
PURPOSE
REPEL
RESISTANT

ROUTINE
SCOUR
SHRINK
SOLVENT
SURFACE
TECHNIQUE

